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ORDER 19 & 23

THE ARCHEOLOGICAL RECORD AT BULL SHOALS LAKE AND NORFORK LAKE ARKANSAS AND MISSOURI

1993

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ARCHEOLOGICAL ASSESSMENTS REPORT No. 87

The Archeological Record at Bull Shoals Lake and Norfork Lake Arkansas and Missouri

by

W. J. Bennett, Jr.
John D. Northrip
Joseph Dunbar
Fran Coulters
Jeffrey Blakely
and
Beverly Watkins

Report Submitted
to the
U. S. Army Engineer District, Little Rock
Little Rock, Arkansas

1993

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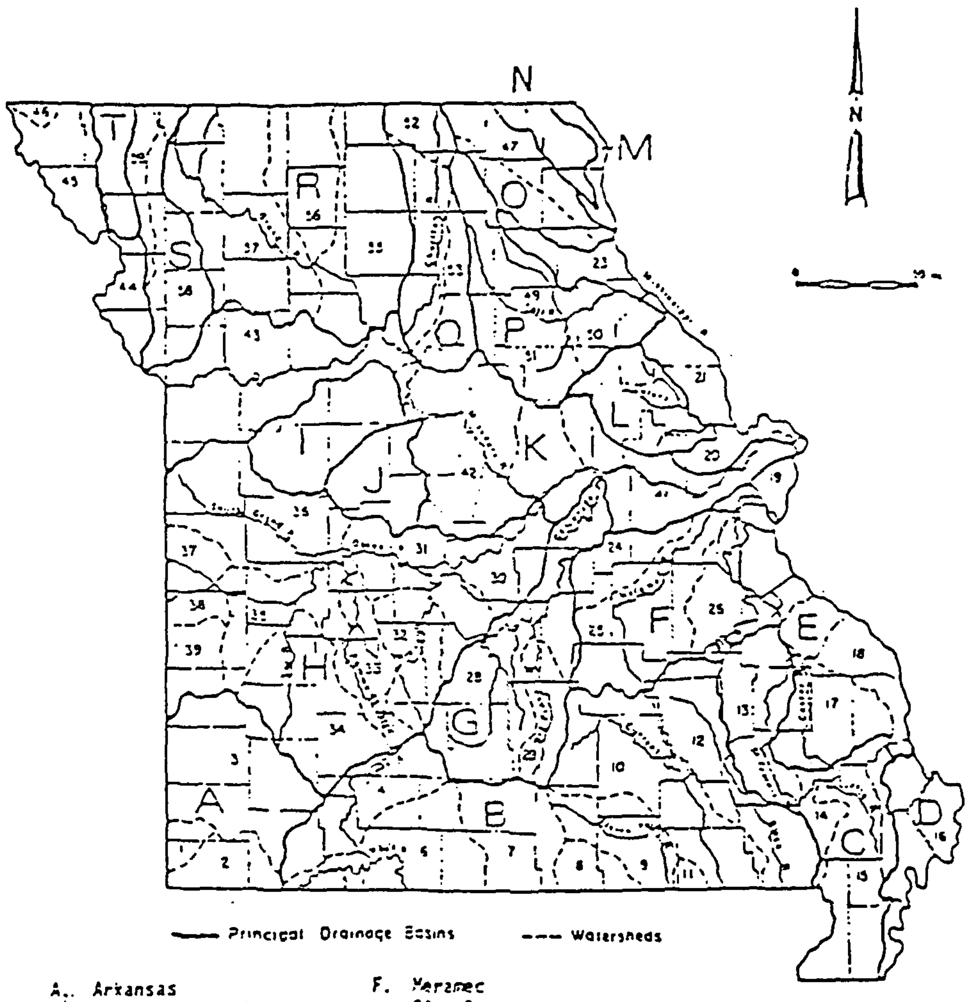
USGS 7.5 Minute Quadrangles: Forsyth, MO, Hilda, MO, Thornfield, MO, Wilhoit, MO, Mincy, MO, Protem SW, MO, Protem, MO, Theodosa, MO, Isabella, MO, Omaha NE, MO, Diamond City, AR-MO, Peel, AR-MO, Cotter NW, AR-MO, Bull Shoals, AR-MO, Udal, MO, Bakersfield, MO, Midway, AR-MO, Clarkridge, AR-MO, Gamaliel, AR-MO

Watersheds: White and North Fork

Drainage Basin: West White



A. Arkansas
1. Lost Creek
2. Elk
3. Spring

B. White
4. James
5. Table Rock
6. White
7. North Fork
8. Spring
9. Eleven Point
10. Current
11. Fourche Creek
12. Black

C. St. Francis
13. Upper St. Francis
14. Lower St. Francis
15. Little River

D. Lower Mississippi
16. Lower Mississippi

E. Upper Mississippi
17. Whitewater/Castor
18. Mississippi 1
19. Mississippi 2
20. Mississippi 3
21. Mississippi 4
22. Mississippi 5
23. North River

F. Meramec
24. Bourbeuse
25. Meramec
26. Big

G. Gasconade
27. Lower Gasconade
28. Upper Gasconade
29. Big Piney

H. Osage
30. Lower Osage
31. Lake of the Ozarks
32. Niangua
33. Pomme de Terre
34. Sac
35. Upper Osage
36. South Grand
37. Marais des Cygnes
38. Little Osage
39. Marmaton

I. Blackwater

J. Lamine

K. Missouri
41. Missouri 1
42. Missouri 2
43. Missouri 3
44. Missouri 4
45. Missouri 5
46. Nishnabotna

L. Cuivre

M. Des Moines

N. Wyaconda/Fox

O. Fabius
47. North Fabius.
48. South Fabius

P. Salt
49. North Fork
50. Salt 1
51. Salt 2

Q. Chariton
52. Upper Chariton
53. Lower Chariton
54. Middle/East Fork

R. Grand
55. Grand 1
56. Thompson
57. Grand 2

S. Platte
58. Platte
59. One Hundred & Two

T. Nodaway

Principal Drainages and Watersheds of Missouri

ABSTRACT

This study was undertaken for the general purpose of gathering sufficient information on cultural resources and their predicted distribution at Bull Shoals Lake and Norfork Lake, Arkansas and Missouri, and to assist in the preparation of Historic Preservation Plans for these projects. The study integrated data from archival research and field observations into an integrated Geographic Information System for the project area landscapes and recorded archeological sites. Basically four different sets of activities were integrated in this effort. These included a reconnaissance level geomorphological analysis of the landscape within the project areas, a review of previously gathered data about the nature and distribution of the archeological record in these areas, an intensive examination of selected portions of the project area's landscape within Norfork Lake, and the synthesis of the results of the information generated into a coherent model of the distribution of the archeological record.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

The Archeological Record at Bull Shoals Lake and Norfork Lake Arkansas and Missouri

INTRODUCTION

Project Background and Authorization

Issued late in 1987, Engineer Regulation 1130-2-438 (ER 1130-2-438) established guidelines for the development of Historic Preservation Programs to be used in the management of cultural resources existing on lands under the management of the U. S. Army Corps of Engineers. This regulation is intended to assist the agency in its efforts to comply with the Archeological Resources Protection Act (ARPA) and the National Historic Preservation Act (NHPA: Public Law 96-515), as amended.

Among other responsibilities ER 1130-2-438.8 requires that

> historic property inventories and site evaluations, where not previously accomplished, should be conducted so that these resources are not inadvertently damaged or destroyed. Inventories are required in order that Corps controlled historic properties can be managed in a systematic and cost effective manner that meets Corps and public needs while ensuring compliance with the NHPA.

ER 1130-2-438(10) recognizes that such inventories were generally not conducted prior to the construction of many existing Corps projects and that funds for the conduct of activities will be limited.

> 10. Inventory/Site Evaluation Priorities at Operational Projects.
>
> a. This and subsequent paragraphs guide District commanders in their treatment of historic properties at operational projects, most of which were completed prior to the passage of present day historic preservation legislation. Many such projects, therefore, contain historic properties which have not been adequately and systematically inventoried and evaluated, or have been investigated on a haphazard or sporadic basis only. It is the intent of this regulation, where not already accomplished, to systematically and in orderly fashion accomplish inventory, evaluation, and any required mitigation studies to achieve full compliance with NHPA and related statutes. Budgetary and manpower constraints dictate that this undertaking cannot be immediately accomplished. It is the responsibility of District Commanders, in consultation with Division Commanders, to prioritize and schedule these investigations in accordance with the particular needs and requirements of each district and operational project.

The activities described in this study were undertaken in order to assist in the development of priorities and strategies for the conduct of inventory efforts at two projects currently under the management of the US Army Engineer District, Little Rock (USAED,LR). The projects are Norfork Lake and Bull Shoals Lake.

This work was undertaken by Archeological Assessments, Inc. (AAI), Nashville, Arkansas, as authorized by Contract No. DACW03-D-86-0068, Order Nos. 19 and 23, in cooperation with the United States Army Engineers, Waterways Experiment Station (WES), Vicksburg, MS.

Project Area Locations and Descriptions (Figure 1)

Bull Shoals lake is one of four multiple-purpose projects (Beaver Lake, Table Rock Lake, Bull Shoals, and Norfork lakes) constructed in the upper White River Basin for the control of floods, the generation of hydroelectric power, and recreational purposes. Bull Shoals Lake was formed by the impoundment of the White River which drains from the Ozark Mountains and eventually empties into the Arkansas River. The Bull Shoals Dam is located at the southeast side of the town of Bull Shoals in Marion County, Northwest Arkansas. Construction of the lake began in 1947 and was completed in 1953. At the top of the conservation pool (654 feet amsl), Bull Shoals Lake measures 45,440 acres with a shoreline of 740 miles, while at the top of the flood control pool (695 feet amsl) it measures 71,240 acres with a shoreline of 1,050 miles. Bull Shoals Lake occupies 99,976 acres in Baxter, Boone, and Marion counties, Arkansas as well as in Ozark and Taney counties, Missouri.

Norfork Lake was formed by the impoundment of the North Fork River which drains from the Ozark Mountains into the White River. The Norfork Dam is located about three miles northeast of the town of Norfork, Baxter County, Northwest Arkansas. Construction of the lake began in 1941 and was completed in 1949. At the top of the conservation pool (550/554 feet amsl), Norfork Lake measures 22,000 acres with a shoreline of 380 miles, while at the top of the flood control pool (580 feet amsl) it measures 30,700 acres with a shoreline of 510 miles. Norfork Lake occupies 53,993 acres in Baxter and Fulton counties, Arkansas as well as Ozark County, Missouri.

Project Goals and Orientation

As stated in the Delivery Orders, the general purpose of this effort was "to gather sufficient information on cultural resources and their predicted distribution on the project landscape that a *Historic Preservation* Management Plan can be prepared in compliance with ER 1130-2-438." The intent of this effort was, therefore, to form a basic understanding of the nature and distribution of the archeological record present at Norfork and Bull Shoals lakes.

Certainly this is not the first such project to be undertaken within the region and, in many ways, this present study is clearly linked to a number of similar efforts undertaken over the past few decades. Notwithstanding the numerous links between this present effort and those conducted previously it is our judgement that this present effort is something of a departure from the way in which such efforts have been conducted in the past.

Such studies undertaken in the White River valley and the larger Ozarks region have usually conceived of the archeological site as a primary object and environmental variables are treated primarily as site characteristics or attributes. This is the principal difference between this present study and prior ones.

This study adopts the position that the archeological record is a characteristic of the landscape rather than the other way around (Saucier 1987: 63). As such this effort is a continuation of the program of inventory undertaken by the USAED,LR within the McClellan-Kerr Arkansas River Navigation System (Bennett et al 1986; Bennett, Breland, and Smith 1989) which sought to integrate the description of the archeological record with a geomorphological analysis of the landscape within the areas directly under management by the USAED,LR. Such an approach has also been used in the inventory of cultural resources at Fort Chaffee in western Arkansas (Bennett 1987; 1988; 1989), and more recently at the Pine Bluff Arsenal in southeastern Arkansas (Bennett et al 1993). This general approach is very similar to that called landscape survey by (Butzer 1982) and paleo-geography by (Weinstein and Kelley 1984). The video, *The Unified Landscape: Earth Science, Archeology, and Resource Management* presented at the Department of Defense Legacy Earth Resources Management Workshop in March 1993 at Eglin Air Force Base, Florida, presents a detailed description of such programs of investigation developed for the USAED,LR. This video is available from the Geotechical

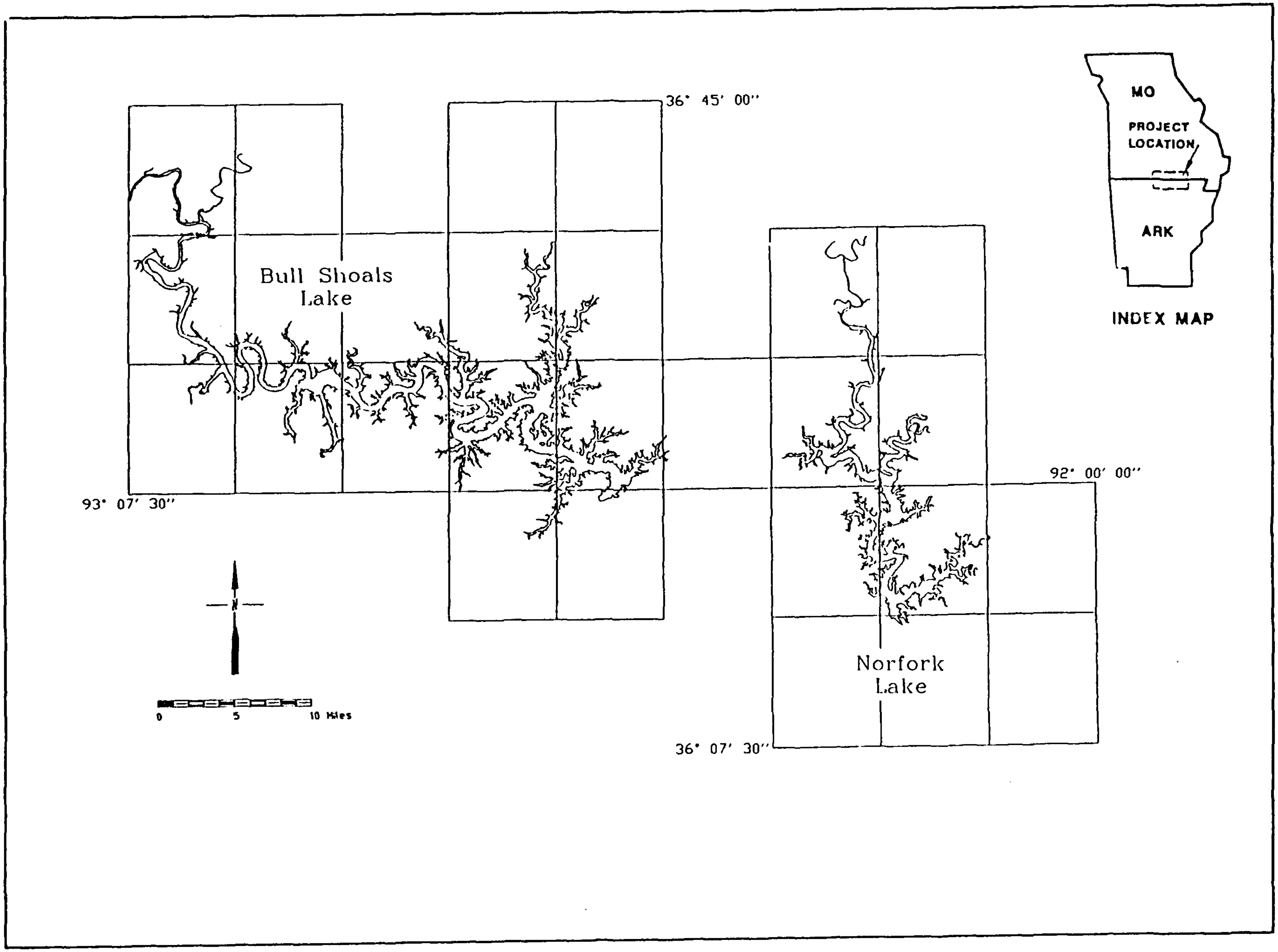


Figure 1. Project Area Vicinity Map

Laboratory, U. S. Army, Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi (POC: Dr. Lawson Smith).

This present effort also uses the concept of site as an important element in the description of the archeological record but consciously attempts to focus attention more directly upon the various elements of the landscape, **landforms**, as the basic units to be considered in the management of cultural resources in the area; a position which is described in some detail in Dunn and Riggs (1992).

In this project our primary goal was to describe the nature and distribution of the archeological record in the project areas. Estimates concerning the possible significance of particular locations, based primarily on field observations regarding the presence or absence of intact deposits, are offered in Part II of this study but no formal investigations designed to establish eligibility for inclusion on the National Register of Historic Places were undertaken.

Report Organization

The report is divided into two parts. The main body of text describes the methods used in this study, summarizes the existing data about the landscape and the archeological record, presents a model for the distribution of the archeological record based on this model, and concludes by offering recommendations regarding future cultural resource management activities.

Part I contains six chapters.

Chapter 1. Summary of Investigations.

This chapter details the various activities undertaken during the course of this project.

Chapter 2. Previous Archeological Investigations.

This chapter provides a brief narrative description of archeological investigations in the region with a focus on attempts to describe the distribution of the archeological record.

Chapter 3. The Landscape.

This chapter presents a narrative description of the landscape; its landforms and landforming processes.

Chapter 4. The Pre-Euro-American Archeological Record.

This chapter considers how those portions of the archeological record related to the pre-Euro-American occupants of the region is distributed across the project areas.

Chapter 5. The Euro-American Archeological Record.

This chapter presents a narrative discussion of the settlement and use of the region since about 1700 drawn from a variety of primary and secondary documentary sources.

Chapter 6. Summary and Conclusions.

This chapter offers a summary statement regarding the distribution of the archeological record and observations for consideration in the development of future cultural resources management activities.

The second portion of this work is a detached appendix intended for the review and use by the USAED,LR and the appropriate review agencies within the states of Arkansas and Missouri. This segment presents the data generated during the pedestrian survey of Norfork Lake. It includes a brief description of the survey methods and a more detailed description of the portions of the archeological record documented by that field effort.

CHAPTER 1. SUMMARY OF INVESTIGATIONS

Theoretical Considerations

As stated above, this study was undertaken in order to assist the USAED,LR in the development of priorities and strategies to guide inventory efforts at Norfork Lake and Bull Shoals Lake in compliance with ER 1130-2-438.

In this regulation the term **Inventory** is defined as "a systematic process to identify all historic properties located on project lands. Inventories are accomplished by means of documentary and archival review, systematic field reconnaissance, and/or survey investigation." (4.c)

Historic properties are defined as "any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in, the National Register of Historic Places." (4.a). Which is also the general definition provided for historic properties by the Advisory Council on Historic Preservation in 36 CFR 800.2(d).

Traditionally, programs designed to determine the number and nature of "historic properties" are based on the assumption that the archeological record they wish to document, evaluate, and manage is composed of a number of more or less independent elements called sites. To determine which sites are significant such programs are usually divided into two parts or steps: Step 1 - find the sites; Step 2 - decide which sites are significant.

Within such a framework any assistance which could be given in the location of sites, particularly significant sites, would be appreciated. It was in this context that predictive modeling developed. In such endeavors researchers attempted to establish correlations (both negative and positive) between environmental variables (such as distance from water, elevation, soils types, to name only a few) which could be identified easily from topographic maps, soils maps and other ready-made depictions of the environment. If it was possible to establish positive or negative correlations between mapped environmental variables and the location of sites (or, even better, significant sites) then site location activities (inventories) could be directed more efficiently toward the discovery of those types of sites (the significant ones) managers wished to find.

The present study seeks to develop an alternative to this approach; one which is based on the assumption that, even though it is created in discrete increments, the archeological record is best understood as an integrated whole rather than as a collection of independent parts. We believe this shift in orientation will not only produce a more efficient program but one which is also based on a more secure theoretical foundation. As stated in the Introduction, this study adopts the position that the archeological record is a characteristic of the landscape. This orientation allows researchers to focus attention not on those arbitrarily-defined segments of the archeological record we call sites, but on the total archeological record which, for the purposes of this presentation, can be defined as the human alterations to the landscape.

In considering the archeological record as human alterations to the landscape it is helpful to think about the two basic ways in which these alterations occur. The most obvious and dramatic way that humans alter the landscape is, of course, by the creation of what we often call the built environment. The creation of the built environment is a prominent feature of the archeological record made by Euro-Americans but is by no means limited to them. The construction of houses and other forms of shelter, the digging of pits, and the quarrying of stone are all parts of the development of a built environment prior to the arrival of Europeans.

The second way in which humans have altered the landscape has been the scattering of artifacts across the region. Up until the last two hundred years or so these scattered materials consisted primarily of bits of lithic debris discarded, recycled, and discarded again and again as the human occupants of the region fashioned and used a wide variety of stone tools in their daily lives. With the coming of the Europeans the variety of such scattered materials increased enormously to include ever increasing amounts of glass, ceramics, metal, and plastic.

The methods available to us to document the nature and distribution of both these scatters of artifacts and residual portions of the built environment which constitute the archeological record vary considerably. For those modifications to the archeological record which took place in the region prior to about A. D. 1800 it is necessary to rely almost exclusively on direct observation for such documentation. To extrapolate from these observations to the human activities which created them and beyond these activities to the social and economic systems within which these activities took place is a matter entirely of imagination; regardless of whether this process is guided by experiments in replication or analogies from the ethnographic present. This is not the case for the modifications of the region's archeological record created over the last two centuries.

The humans who have been altering the landscape over the last two centuries also left us records about what they did, when they did it, how they did it, and, occasionally, why they did it. Thus, it is possible to document the nature and location of a large percentage of the elements of the built environment created since the early years of the 19th Century without actually setting foot within the project areas. To the extent that artifact clusters correlate with various aspects of the built environment it is also possible to estimate rather precisely both the location and, to a great extent, the general nature of the artifact scatters created over the past two hundred years within the project areas in the same way. The same cannot be said of those modifications to the archeological record which took place prior to the end of the 18th century. The nature and location of such modifications can only be determined by direct field observation or extrapolations based on such direct observation. Given this distinction, it seemed appropriate that we develop our description of the nature and distribution of the archeological record using different methods. Our discussion of the archeological record created prior to the arrival of the Europeans during the 18th Century is based directly on field observations made by us and others over more than 100 years. The discussion of the archeological record associated with the Euro-American occupation of the region relies primarily on documentary evidence.

Documenting the Pre-Euro-American Archeological Record

Overview. In the first portion of this study we consider those elements of the archeological record which have been documented by direct observation; primarily scatters of artifacts originally deposited in the archeological record long before the first Europeans arrived in the region. This portion of the study, we believe, presents an accurate depiction and projection of the nature of these elements of the archeological record and their distribution across the various project area landforms. It was created by integrating spatial data, the distribution of various types of landforms, with information about the various sites, features, and artifacts into a single Geographic Information System (GIS) data base.

Basically four different sets of activities were integrated in this effort.

1. a reconnaissance level geomorphological analysis of the landscape within the project areas;

2. a review of previously gathered data about the nature and distribution of the archeological record in these areas;

3. an intensive examination of selected portions of the project area landscape within Norfork Lake which included a pedestrian survey, description of sites, and analysis of artifacts; and,

4. the synthesis of the results of the information generated by activity sets 1-3 into a coherent model of the distribution of the archeological record.

Geomorphological Analysis. The first objective of the study was to identify and map the geomorphic features within the study area. This was undertaken by Joseph Dunbar and Francis Coulters of WES under the direction of Lawson M. Smith. The analysis of the landscape presented in this study is taken largely from Dunbar and Coulters (1989a; 1989b). The figures presented in this report related to the geologic and geomorphological setting of the project areas were taken from these studies.

As part of the initial phase of this portion of the project a literature review of the project area was conducted prior to adopting a landform classification. Data were obtained about the soils, the geology and geomorphology, and the archaeological sites. In addition, U.S. Army Corps of Engineers construction and environmental impact reports for the dam and the reservoir area were obtained for evaluation.

The literature review was conducted to establish basic criteria for a landform classification in the project area. The primary consideration of the landform classification was that it address both the fluvial and the hill slope geomorphic systems as the project area incorporates features from both. Second, it was important that the classification define the landscape prior to the dam construction in order to compare different parts of the study area to each other and thereby determine the effects of reservoir flooding. Last, it was important that the classification be suited to the mapping scale, be relatively simple to use and still aid the archaeologist in evaluating cultural resources, and also allow for later expansion and definition of additional landforms if desired.

Mapping was done at a scale of 1:24,000 on twenty six 7.5 minute USGS topographic base maps. Delineation and definition of the primary geomorphic features was accomplished primarily by analysis of topographic data, aerial photography (black and white sterographic coverage, 1:12,000 scale, flown December 1983), and a field reconnaissance survey of the project area. The criteria that were used to define the various geomorphic features in the project area are explained in detail below.

The field reconnaissance of the project area was conducted to verify the results of the geomorphic mapping accomplished using remotely-sensed and previously gathered data and to identify general characteristics of the different landforms. The field reconnaissance was a joint effort between geologists from WES and archaeologists from AAI. This activity was assisted greatly by the participation of James Hoelscher who served as consulting soils scientist to the project.

Field activities consisted of the examination of the various landforms which were accessed by boat (Figure 2) and a four-wheel drive vehicle. Soil sampling was done at selected locations along the terraces in the headwaters of Bull Shoals and Norfork lakes. The purpose of the soil sampling was to further define terrace characteristics (Figure 3). Soil sampling was conducted with a truck-mounted, chain driven soil probe (two inches in diameter). Maximum depth of sampling by the soil probe was about three meters.

Figure 2. Boat Access to Cutbank Profiles

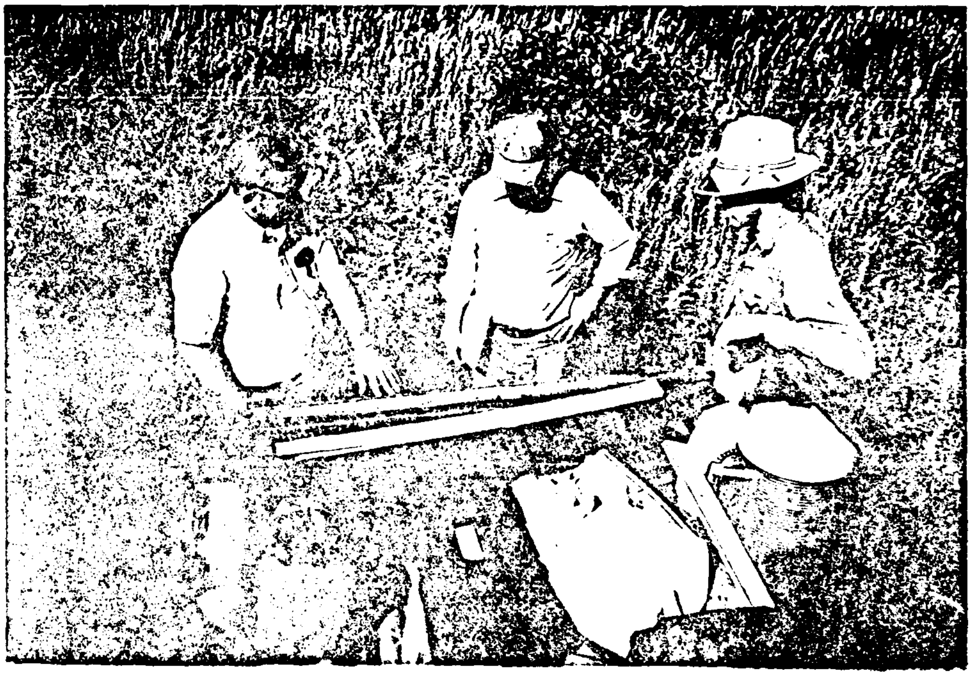


Figure 3. Interpretation of Soil Cores

The general landform classification system used in this study is presented in Table 1 and is shown in Figure 4. This system contains five primary landforms or map units. The individual landforms are differentiated according to various physical characteristics such as geomorphic system, slope, geology, composition of the underlying material, apparent age, and the types of processes active on each of the different surfaces.

Table 1. Summary of Landforms and Processes

Map Unit	Landform	Percent Slope	Slope Angle degree	Geomorphic system	Slope Type	Type of Material*	Geomorphic Processes**	Landform Age***
1	Summit	< 10	< 6	Hillslope	Convex	BR-TS	SFP-BT-SC-ER	?
2	Sideslope	> 10	> 6	Hillslope	Convex/ straight/ concave	BR-TS	SFP-BT-MM-ER	?
3	Footslope	5-10	3-6	Hillslope	Concave	COL-BR-ALUV	SFP-BT-DCOL-ER-VA	?
4	Terrace	< 10	< 6	Fluvial	Concave	ALUV-BR	SFP-BT-ER-VA-FS	P-H
5	Floodplain	< 5	< 3	Fluvial	Horizontal	ALUV-BR	VA-LA-BT-FS-ER-SFP	H

* BR = Bedrock (primarily Ordovician dolomites), TS = Thin residual soil, COL = Coluvium, ALUV = Aluium

** SFP = Soil forming processes (pedogenesis), BT = Bioturbation, MM = Erosion by mass movements, SC = Soil creep (Rock falls, Rock slides, Debris flows, Soil falls), ER = Erosion by sheet wash, rill formation, and gully formation, DCOL = Deposition of erosion products from MM and ER, LA = Lateral accretion, VA = Vertical accretion, FS = Fluvial scouring

*** H = Holocene (< 10,000 years), P = Pleistocene (2 million - 10,000 years), ? = Unknown - estimated to have bgun during Tertiary period (66-2 mybp)

Several of the major landforms have been subdivided further to differentiate some of the more important physical characteristics or processes that are dominant. These additional subdivisions are described in more detail below.

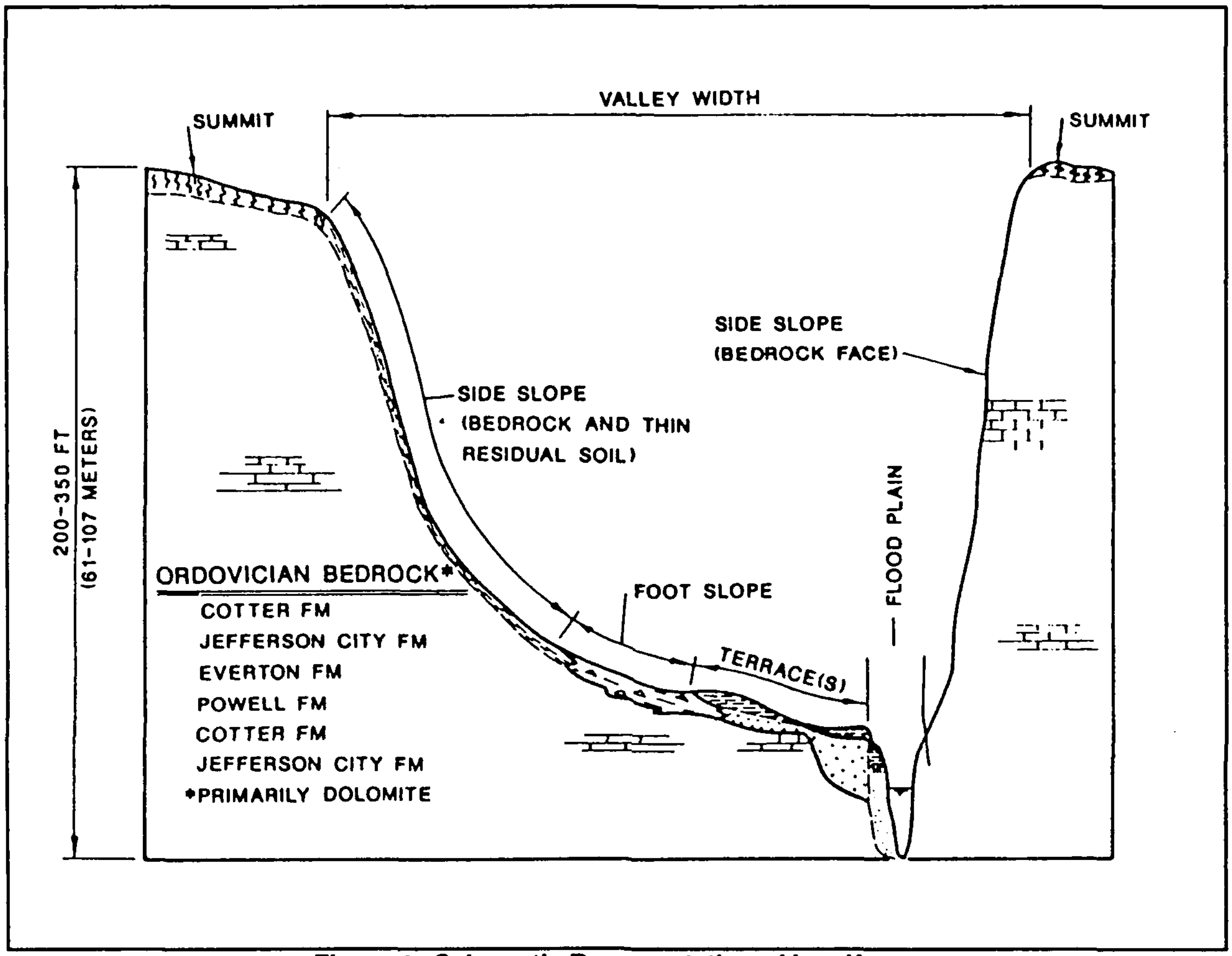


Figure 4. Schematic Representation of Landforms

Records Search. Prior to field work at Norfork Lake a records check to determine the location and descriptions of previously recorded sites in the project area on file with the USAED,LR, the Arkansas Archeological Survey, and the Archeological Survey of Missouri.

A further examination of the state site files for the Bull Shoals and Norfork lakes project areas was conducted at the Archaeological Survey of Missouri offices in Columbia, Missouri, in November, 1988, by John Northrip. With the invaluable assistance of the staff of ASM, xerox copies were made of state site forms of all previously recorded sites within the Missouri areas of the project areas. The Missouri Department of Natural Resources, Office of Historic Preservation, Jefferson City, Missouri, was also visited at this time, where site location maps and other pertinent materials were examined.

In the spring of 1989 John Northrip conducted a site file search at the Office of the Registrar, Arkansas Archeological Survey, in order to compile information from Boone, Marion, and Baxter counties into the dBaseIII + data base. This information was checked against information maintained in the computerized site data base at the USAED,LR in order to make the final data determinations.

Intensive Survey. Fieldwork within the Norfork Lake project area began on 4 June 1988, and continued through 10 August 1988. The intensive cultural resources survey, conducted under the direction of W.J. Bennett, Jr., was performed by an AAI field team composed of John D. Northrip (crew leader), William H. Isenberger, and Robert O. Abbott.

Initial efforts were directed toward the four proposed public use areas: Lick Creek, Seward Point, Big Creek, and Ford Cove. Four existing public use areas were also investigated: Pigeon Creek, Cranfield, Panther Bay, and Georges Cove. The completion of a cultural resources inventory for the Norfork Lake properties within the state of Missouri comprised the final efforts of this investigation.

The areas investigated were designated as Survey Units. The boundaries of each Survey Unit were determined by either existing delineations, as in the case of public use areas, or arbitrarily, as in the portion of the project area within Missouri. Survey Unit boundaries were transferred to the appropriate USGS 7.5 minute quadrangle sheet, which was used as a base map for the field investigations. Each member of the survey team used a copy of the Survey Unit map, as well as personal field notebooks, to record observations made of both the cultural and natural landscape of the areas investigated. A total of 16 different Survey Units were examined during this effort (Figure 5).

Access was gained to the Survey Units by boat and a four-wheel drive vehicle. Field conditions during the summer of 1988, specifically dense vegetation, resulted in the dependance on sub-surface investigations, primarily shovel tests, to document the archeological record within the study area (Figure 6). Soil coring, using both a 1/2" hand probe, and, where possible, a 2" hydraulic Bull Soil Coring Device, was conducted on landforms considered to have the potential of containing both shallowly (0-1m) and deeply (1-3m) buried cultural deposits. Areas of opportunistic exposure, such as cut-banks and eroded shoreline, were also closely inspected (Figure 7). Observations made during these activities were made available to the geomorphological investigation of the project area being conducted by WES, allowing refinement of the landscape model used to direct the intensive cultural resources survey.

Figure 6. Shovel Test, Survey Unit No. 4. Norfork Lake

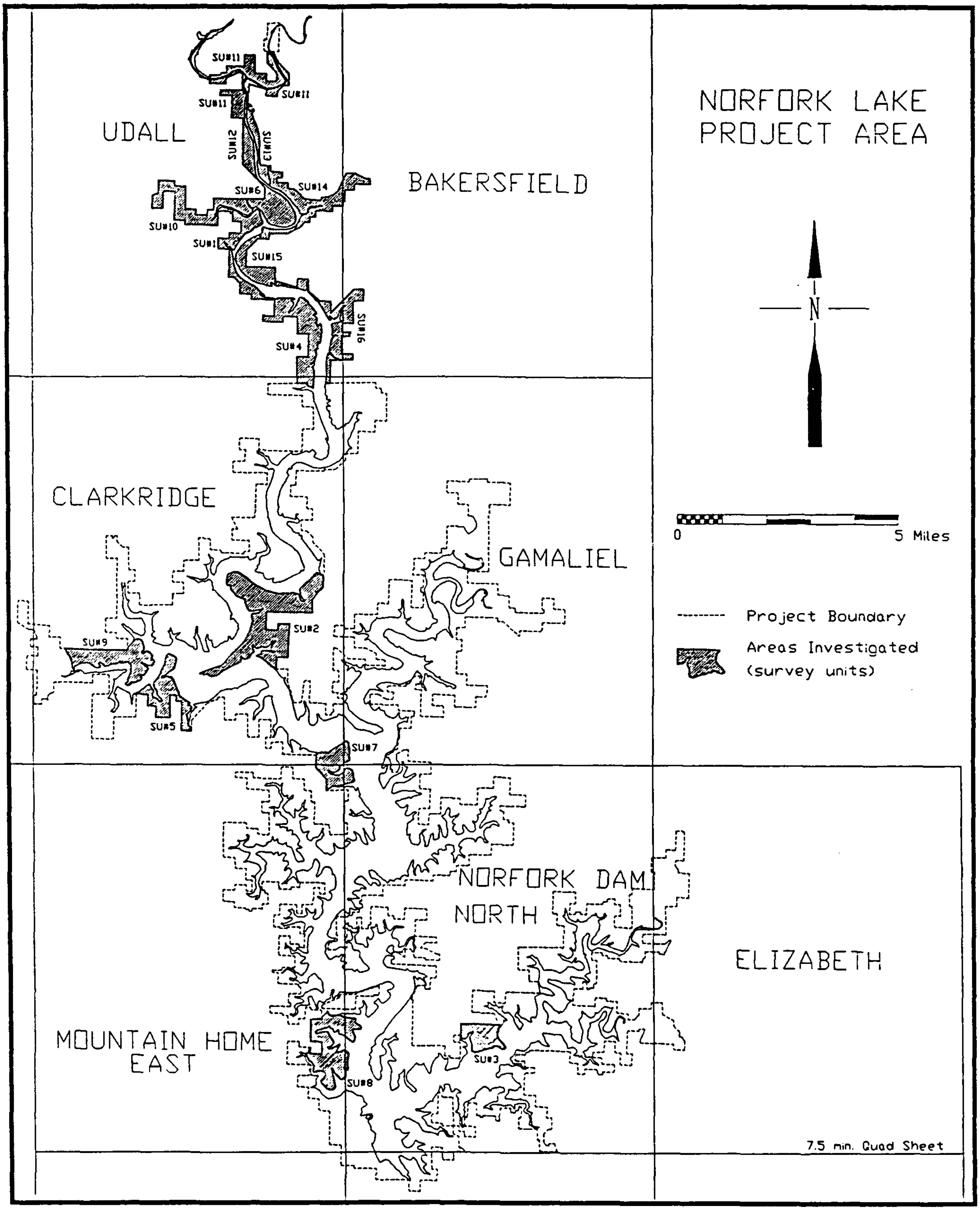


Figure 5. Location of Survey Units at Norfork Lake

Field methodology was determined by the distribution of landform types within the survey unit. Alluvial deposits were investigated by pedestrian transects spaced at 25m intervals, and shovel tests were excavated along these transects at approximately the same interval. Transect orientation was controlled by compass bearing. Shovel tests on these landforms were ca. 30cm in diameter, and were excavated to a depth of 30-70cm below the surface. Matrix removed was closely inspected for cultural materials, and observations were made of the soil profile. Transects on upland landforms were conducted at intervals determined by degree of slope: low-angle (ca. 6 degree or less) surfaces such as summits, benches, and primary foot-slopes were investigated at 25-50m intervals, and intervals on steeper slopes were maintained at 100-200m where possible. Due to the hazards presented by the steepest slopes and vertical rock faces, only the base of blufflines were walked in an attempt to locate overhangs and shelters. Transect orientation was determined by the trend of the landform, and shovel tests were excavated at the same interval as the transect spacing. Surface exposures were encountered more frequently in the uplands than on the alluvial landforms within the project area, and tree-throws, glade areas, eroded shorelines (Figure 8), and other surface disturbances were closely inspected when encountered.

Figure 7. Examination of Cut Bank. Norfork Lake

When elements of the archeological record were encountered, the same basic procedure was used to document the resource. The extent of the deposit, both horizontal and vertical, were determined by surface observation and shovel testing on a grid. Surface features, cultural material surface scatters, controlled surface collections, and the location of shovel tests were recorded on a sketch map prepared with compass and careful pacing, along with general topographic information (Figure 9). Project site forms, materials observed forms, and soils description forms were completed to insure that sufficient data was recovered from each location to complete Archaeological Survey of Missouri and Arkansas Archaeological Survey site forms, and to allow evaluation of significance under criteria for nomination to the National Register of Historic Places. A photographic record was made of the area and specific elements of the resource if deemed appropriate. Materials collected were labeled to provenience and briefly described. Locations were plotted on survey unit maps, and information was summarized on survey unit forms.

All recovered materials have been cleaned and catalogued for curation in the University of Arkansas Museum, Fayetteville. All artifacts were described and the descriptions encoded into one of the data bases listed below. Analysis of lithic materials was done by John Northrip. Drawings of selected lithic artifacts was done by John Northcutt. Analysis of historic period materials was done by Greg Hill.

Figure 8. Shoreline Surface Exposure. Norfork Lake

Figure 9. Site Documentation in Heavily Vegetated Area

Data Synthesis. Data synthesis was accomplished through the creation and integration of various types of computer data bases. The initial stages of the creation of the graphic component of this system was done using the GRASS system at the USAED,LR under the direction of John Riggs, archeologist, USAED,LR. The initial set of coverage was subsequently transferred to the pcArcInfo system at AAI where these coverages were edited by William Isenberger. The location of sites at Bull Shoals and Norfork lakes were added by William Isenberger as were the locations of the Survey Units at Norfork Lake. As presently configured the GIS data base for Norfork Lake includes six coverages; Boundary, Landscape, Lake, Sites, Survey Units, and Landscape for the Survey Units. Coverage for Bull Shoals Lake include Landscape, Lake, Site, and Quadrangle Sheet.

Data related directly to archeological sites and materials were organized into three alpha-numeric data bases within the dBaseIII+ system; all linked through the state site number. This integrated data base system was developed by Brauna Hartzell and has been used in numerous AAI projects.

The initial task in this part of the project was to transfer certain categories of data from the state site forms to separate data bases for Norfork Lake and Bull Shoals Lake. This task was undertaken primarily by John Northrip and Robert Bennett. The structure of these two data bases was identical. The data base for Norfork Lake contains 156 records and the data base for Bull Shoals Lake contains 269 records.

Each record contains 18 fields. These are

1. Field Number - a temporary designation indicating the number assigned during field work for sites initially recorded during the intensive survey of Norfork Lake or identifying other sources of data from which the record was complied; i. e., field number = Pad 77 indicates that the information about this site came primarily from Padgett's description of the site as it appeared in Padgett (1977).

2. State Number - the trinomial designation assigned by the states, e. g. 23OZ01, 3BA165

3. Quadrangle Sheet - the 7.5 minute USGS quadrangle(s) on which the site is mapped

4. Landform - the landform as designated by WES. This was the designation originally assigned using the numeration which was originally assigned by WES.

5. GIS Designation - this is the designation of the landform(s) onto which the site is located within the GIS data base.

6. Deposit Type - (one of the following)

    unknown
    isolated find
    surface scatter
    subsurface deposit
    other

7. Cultural Affiliation (one or more of the following)

    Unknown Prehistoric
    Paleo-Indian
    Archaic
    Woodland
    Archaic/Woodland
    Woodland/Mississippian
    Mississippian
    Historic

8. Prehistoric Inventory (one or more of the following)

Dart or Arrow Points
Bifaces or Biface fragments
Unifacial Stone Tools
Flakes
Lithic Debris
Fire Cracked Rock
Ceramics
Baked Clay
Other

9. Historic Inventory (one or more of the following)

Ceramics
Glass
Metal
Building Materials
Other

10. Features Recorded (one or more of the following)

Unknown
None present
Burials
Houses
Pits
Rock features
Historic
Other

11. Extent (one of the following; measurements in meters square)

unknown
1 - 9m
10 - 99m
100 - 499m
500 - 999m
1,000 - 4,999m
5,000 - 9,999m
> 10,000m

12. Depth (one of the following)

unknown
1 - 9cm
10 - 20cm
21 - 30cm
31 - 50cm
50 - 100cm
> 100cm

13. Intact Deposits (one of the following)

Unknown
None present
Present
Likely
Unlikely

14. Previous Disturbance (one of the following)

Unknown
None
Clear Cut
Shoreline Erosion
Construction
Vandalism
Other

15. Amount of Disturbance (one of the following)

Unknown
None
Slight
Moderate
Major

16. Status (one of the following)

No further work
Further Work
Eligible for NRHP

17. Collection Made (yes/no)

18. Description. This field is a narrative description of the collection and the location at which it was made. It is a composite narrative summary made from the various sources of written information available about the site.

It is possible to query the data base on any of these values or any combination of values. For example, it is possible to determine the distribution of recorded ceramic materials across the various landforms. Which locations have prehistoric pits or burials reported.

In addition to these site data bases, the materials collected during the 1988 survey have been entered into three separate databases; one each for lithic artifacts, flakes, and historic artifacts.

The fields included within the flakes data base is as follows.

1. Field Number (as above)

2. State Number (as above)

3. Provenience - surface location or shovel test designation

4. Number of Items

5. Material - type of lithic material, i. e., chert, quartzite, etc.

6. Size - size designations for complete or nearly complete specimens

7. Platform - indication of presence or absence

8. Cortex - indication of presence or absence and cortex type, i.e., stream or weathered cortex

9. Special Observations

The data base for the recovered lithic artifacts contains the following categories of information.

1. Field Number

2. State Number

3. Provenience (as above)

4. Description - a brief, abbreviated prose description of the item, i. e., flaked chunk, biface midsection, mano fragment, etc

5. Material - (as above)

6. Cortex - (as above)

7. Heat Fracture - presence or absence

If the item is a biface then the following information is coded

8. Biface type - point, biface, etc

9. Biface part - portion of the biface, i. e., whole, tip, edge fragment

10. Edge Modification - Present or Absent

11. Evidence of Reuse - Present or Absent

12. Production Failure - True, False, Unknown

13. Broken in Use - True, False, Unknown

If the item is not a biface then the following information is coded.

14. Tool type - type of tool, i. e., modified flake, mano, hammerstone

15. Edge Modification - Present or Absent

A third alpha-numeric data base was constructed for the recording of descriptions of historic artifacts. The information included in this data base included the following categories.

1. Field Number

2. State Number

3. Provenience

4. Number (number of examples)

5. Material Class - Ceramics, Glass, Metal, etc.

7. Material Type - Each material class has coded values for its material type. For example, listings for material type under ceramics include a range of different ceramic wares such as pearlware, medium paste whiteware, stoneware, etc.

8. Vessel Part - whole, rim, base, fragment, etc.

9. Vessel Type - cup, bottle, jar, etc.

10. Color of the Interior

11. Color of the Exterior

12. Surface Finish - slip, glaze, plain, etc.

13. Decoration Type - handpainted, transfer-print, etc.

14. Decoration Motif - bands, floral designs, etc.

15. Decoration Color

The data base allows for items 13, 14, and 15 to be repeated so that the system can track coded values for two types of decoration types, motifs and colors, i. e., dark brown, handpainted, annular bands; green underglaze floral designs.

16. Notes - specific remarks about particular pieces.

Using these three data bases it is possible to count and to track the occurrence the distribution of a larger number of very different types of artifacts. For example, it is possible to determine the number and distribution of all the modified quartzite flakes, chert flakes which retain stream-worn cortext (as opposed to residual cortext), chert dart point tips, square nails, and cup fragments with cranberry colored underglaze floral designs.

These alpha-number data bases are linked to the graphics component of the GIS system in pcArcInfo GIS so that it is possible to display the distributions of sites and materials graphically on the system. For example, if the location of a proposed project is known, the system can be queried to show the location of recorded sites in the area. Further information about these sites is gained by using the cursor to call up the encoded information, including the narrative description of the site, on the screen.

In concluding this section it is important for us to point out that there are certain very clear limitations to these data bases. Obviously they are not any better than the data they contain and it is our judgment that the quality of information within these various records is subject to substantial variation. In particular the information available about the sites in Bull Shoals must be considered with a great deal of caution. Quite often the site forms contained conflicting information about what was or was not present at a location. We also found that many times a single site had been plotted in a number of different locations, sometimes hundreds of meters apart and on different sides of the river. It was impossible to resolve many of these problems within the confines of this project and, indeed, because so many of these locations are now permanently inundated it will continue to be impossible to resolve most of these differences.

It is also important to remember that the landform analysis was done at a scale of 1:24,000 and should not be considered accurate beyond that scale. This means that boundaries between landforms may not be exactly (to the meter) where they are mapped. Further, since it was impossible during this effort to field-check every single landform, the determination of some individual landforms, particularly very small ones, may not be exact.

Documenting the Euro-American Archeological Record

Activities involved in this portion of the effort included all of the previously mentioned activity sets plus a considerable amount of documentary research. The consideration of the archeological record associated with the Euro-American occupation of the area rests primarily on an initial analysis of documentary evidence and very little on direct field observation. This portion of the study involved the review of various primary and secondary materials by Jeffrey A. Blakely and Beverly Watkins. The sources consulted are referenced within Chapter 5.

CHAPTER 2. THE ARCHEOLOGICAL CONTEXT

There have been a number of prior archeological investigations conducted within this region and there exist several lengthy summaries of these efforts. These summaries include a review of archeological resources within the watershed of the White River (Spears, Myers, and Davis 1975), a compendious overview compiled for the Mark Twain National Forest by the Center for Archaeological Research (CAR), Southwest Missouri State University (Douthit et al 1979), an overview for the Ozark-St. Francis National Forest prepared by the Arkansas Archeological Survey (AAS) (Sabo et al 1982) and the elaboration of this study made for the Southwestern Division of the Corps of Engineers (Sabo, Waddell, and House 1982). Given these recent recapitulations it is not necessary to describe in detail all of the previous regional investigations. Rather, in this effort we will be content to offer a brief summary characterization of the major emphases of prior archeological investigations and to concentrate our attention on those efforts which have been explicitedly concerned with investigating the way in which the archeological record is distributed across the landscape.

Early Accounts

Descriptions of portions of the archeological record of the region were occasionally made by early travelers, naturalists and adventurers. One of the earliest was Henry R. Schoolcraft who left us this description of two sites near Bull Shoals (Park 1955: 138-140).

> At these shoals lead ore (galena) is found in small lumps, adhering to the rocks in the river on the shores, with some calcareous spar; and the banks are further rendered interesting by some remains of ancient works, wnich appear to indicate that it has been the seat of metallurgical operations in former ages, and previous to the deposition of the alluvial soil upon the banks, for beneath this soil are imbedded the reliqua in question. Thus imbedded masses of a metallic alloy, manifestly the production of art, with bits of earthern pots, and arrow-heads chipped out of flint, horn-stone, and jasper, are found. The metallic alloy appears from hardness and colour, to be lead united with silver or tin. It is not well refined, although it may be easily cut with a knife. The earthenware appears to have been submitted to the action of fire, and has suffered no decay. Of all these I procured specimens, of which duplicates are to be seen among the collections of Dr. Samuel L. Mitchell, at New York. ...
>
> Mr. Friend having represented the antiquities in that neighborhood as worthy of examination, together with the mineral appearances on the hills, situated back from the river, we determined to devote a part of the day to that object. The hills, like every other section of this county noticed, proved stratified masses of secondary lime-stone covered by a deposit of elder alluvion, the surface of which afforded radiated quartz, and fragments of horn-stone, but no particular indications of a metalliferous character were observed. The antiquities, situated principally on the east bank of the river, at the Bull Shoals, have already been mentioned. Some further appearances of this kind are seen at a distance of half-a-mile below the dwelling of Mr. Friend, where I procured an excellent kind of flint, and some antique bones and arrow-heads, from beneath a heavy bed of alluvion covered by trees.

Frederick Gerstaecker, an early 19th Century hunter and traveler, reports an account of a burial site described to him near the Spring River. According to Gerstaecker, a farmer with whom he was staying

> informed me that there were a number of sepulchral monuments on the banks of the Spring river, or in its neighbourhood, and spoke of gigantic bones and skeletons which had been found there...He also said that he had found urns and weapons in the graves; but he had none to show me....

> On the banks of the neighbouring White river, they had found bricks some feet under the surface in several places, laid as if they had formed a street or road, and my host, as well as several others, maintained that there must have been a town there. (Gerstaecker 1968:84)

Within this literature the earliest description of how the archeological record was distributed we have been able to discover was made by the early 20th Century traveler Bushnell in his comments about the locations of ancient Indian villages within the White River valley (D. I. Bushnell 1904: 295,296)

> The village and camp sites occur in the bottoms, on the banks of the rivers. Where two stream unite there is always evidence of a settlement in several instances stone implements may be found scattered over an area of ten acres or more, indicating the site of a large village....
>
> In the valleys of James and White rivers, sites are even more numerous and more clearly defined than in the vicinity of the Gasconade. That part of the state being thinly settled, much of the bottom land has not been cultivated, consequently many of the ancient sites remain as they were left by the Indians.

The Bluff Shelters

Notwithstanding these early accounts of the apparent richness of the archeological record at what came to be called "open sites," the portion of the archeological record which has attracted the greatest interest is that which is contained within the region's bluff shelters. Such sites and the extremely rare types of artifacts preserved there were first called to the attention of the archeological community by M. R. Harrington who had been informed of their existence by local residents. In the introduction to his first publication on these remains Harrington wrote,

> As there may be considerable delay in the final publication of the results of the recent archeological explorations in the certain dry rockshelters of the Ozark mountains, carried on by the Museum of the American Indian, Heye Foundation, *this brief preliminary paper is offered* with a view of affording some idea of the nature of the work, and of the unusual character of the artifacts found. ...
>
> Without attempting, in this brief article, to trace in detail the causes which led to this exploration, it should be stated here that Dr. W. C. Barnard of Seneca, Mo., was the first to call the writer's attention to the possibilities of the region, and that Dr. J. H. Webb of Eureka Springs, Ark., Mr. J. A. Wyrick of Busch, Ark., and Mr. J. A Truitt of Noel, Mo., rendered valued advice and assistance. Among the many others who helped were Dr. George M. Paxton of Baton Rouge, La., his brother Mr. Charles Paxton of Nail, Newton Co. Ark., and Mr. C. V. Robinson of Rogers, Ark. (Harrington 1924: 1,2)

The way in which Harrington described the remains he encountered in these shelters set the direction for the next several decades of archeological activity within the region.

> It was soon discovered that, so far as the shelters on upper White river were concerned, and with the exception of a few articles found only on or near the actual surface, we were dealing with a single culture, for the character of the specimens was quite uniform throughout the deposits from top to bottom. For this reason, and because the cliffs are locally known as "bluffs," it was decided for convenience to apply the term "Ozark Bluff dweller" to their ancient inhabitants. When we later moved to Cowskin River in Missouri, however, it was found there that the alien surface objects became more numerous, and in two rock-shelters a distinct stratum containing such articles could be distinguished, laying above the Bluff Dweller Layer. This new culture will be called, for the present, at least, the "top-layer culture." (Harrington 1924: 4)

The most immediate effect of Harrington's discoveries was to direct professional archeological interest toward the recovery of the shelters' inventory of unique artifacts. During the 1930s the University of Arkansas Museum sponsored numerous excavations within many of the bluff shelters of northwest Arkansas. S. D. Dellinger, the director of the University of Arkansas Museum, provided the overall direction for this work. These excavations concentrated on the recovery of the shelter's perishable materials such as textiles and cordage as well as plant and animal remains which, along with the excavation records, were stored in the University of Arkansas Museum.

Contemporary publication of these excavations was sporadic and were often concerned with publicizing the more unusual of these artifacts. It was not until the 1960s that concerted programs designed to analyze these materials was undertaken; primarily in the form of Master's theses prepared under the direction of the Department of Anthropology at the University of Arkansas - Fayetteville. Bennett and Stewart-Abernathy (1980) provides a summary listing of the published investigations undertaken at the various of these shelters in northwest Arkansas through 1980. For a more recent discussion of these excavations and the analysis of recovered materials readers are directed to the summary provided in Fritz (1986) which is a detailed consideration of the paleo-botanical materials recovered from these sites.

Another very important impact that Harrington's work had stemmed from his judgment that these sites had been populated, at least until very late in their history, by a single cultural group whose artifact assemblage seemed to him to indicate very little in the way of cultural change over several millennia of occupation. This lack of observed change within the material culture inventory led to the development of what came to be known as the Ozark Refugium theory within which the population of the region was understood to have remained culturally static while that of neighboring regions was undergoing rapid cultural change. Largely because of its rugged topography the Ozarks were understood to have been largely isolated from developments in either the Arkansas River Valley and/or the Mississippi River Valley. This depiction has been recently challenged by a number of researchers (cf. Brown 1984) who have sought to draw attention to several elements of the regional archeological record which have parallels with the late prehistoric cultures of the Arkansas and Mississippi valleys; particularly the archeological records at mound sites.

The Reservoir Salvage Projects

The years immediately following the Second World War saw a dramatic increase in professional archeological activity in the White River valley; spurred primarily by the construction of four major reservoirs; Beaver Lake, Table Rock Lake, and Bull Shoals Lake on the White River and Norfork Lake on the North Fork River.

As far as we can presently discern there was no systematic effort made to document the archeological record prior to the construction of Norfork Lake. Indeed, when he began his shoreline survey of Norfork Lake in 1977 Padgett wrote

> Since no scientifically conducted archeological investigations of the area had been carried out at Norfork Lake prior to the dam construction in 1943, the only information about archeological sites in the area was contained in reports on 10 sites submitted to the Arkansas Archeological Survey by amateur archeologists from Mountain Home and a published report on one site in Missouri (Tong 1951). (Padgett 1977: 1)

Tong (1951) describes the excavation of a five-foot-square test excavation at the Tecumseh Site, located at the confluence of the North Fork River and Bryant Creek. Under the direction of William M. Morrison, members of the Twin Lakes Lodge, Ozarks Chapter of the Missouri Archaeological Society, four six-inch levels of soil were removed, and soils and artifact descriptions are provided. This area was not registered with the Archaeological Survey of Missouri until 1983, when information supplied by Del Thompson of Colorado Springs, Colorado, was assigned the ASM number 23OZ93.

With the impoundment of Bull Shoals Lake, however, a concerted effort was made to describe and to "salvage" portions of the archeological record. The initial survey, directed by Carl Chapman, was conducted by participants from the University of Missouri, the Missouri Resources Museum, and the Missouri Archaeological Society. Leonard Haslag provides us with a description of these early activities (Haslag 1946:1-3).

> In the fall of 1946, from November 13 to November 18, the Missouri Archaeological Society and the Missouri Resources Museum conducted archaeological investigations in the White River region of Taney and Ozark Counties, Missouri. The area surveyed is in the Bull Shoals Dam Reservoir which

threatened many archaeological sites by inundation when the project would be completed. These Indian sites, would be lost to scientific archaeological research once the reservoir filled and flooded the White River valley and its many tributaries. The purpose of the survey was to locate and record as many Indian sites as possible and to salvage some of the material remains so the cultural pattern of the region might be more complete. Location of important sites would also allow future organized field parties to move in and conduct thorough investigations of the most important archaeological sites.

When the go-ahead word of the construction of Bull Shoals Dam in Arkansas was announced serious minded archaeologists in Missouri received the same word, for this impoundment would cover many Indian remains in the White River Valley north of the Arkansas state line in Missouri. Already, for hundreds and thousands of years nature had been slowly destroying evidences of prehistoric peoples whose way of life was buried in this soil. Now this new man-made threat to bury it still deeper. An answer had to be found. Time was certainly our first thought and we just simply had to do the best we could.

The preliminary survey in the fall of 1946 was directed by Prof. Carl H. Chapman, director of American Archaeology at the University of Missouri. The writer of this article assisted as director in the field.

Headquarters for the expedition were established at Forsyth, Missouri. Much had to be done and a week was short. Some of the party worked in pairs while others were selected to hit long stretches alone. We were driven to our starting point for the days (sic) work and were to reach a predetermined spot by nightfall. Evenings were devoted to discussions, cataloging artifacts and assembling data of the days (sic) search. Operations for the following day were decided, thus using our time to the fullest.

At the conclusion of this effort the investigators held a public meeting.

A conference was held in November 16 and despite inclement weather a large attendance was enjoyed. Material found during the week's survey was discussed and shown to the public. After the conference a field trip was taken to the farm of Mr. Hal Robbins. Two sites, a pottery and a non-pottery site were visited. The non-pottery site was used to demonstrate the proper way to locate and describe archaeological sites. The pottery yielding site was used to demonstrate the way to test by trenching using six inch levels. Only charcoal was discovered in the test pit on this site. (Haslag 1946:11)

Lynn E. Howard, then the assistant director of the University of Arkansas Museum, described subsequent efforts to investigate portions of the archeological record within those portions of the Bull Shoals Reservoir within Arkansas.

In the summer of 1949 the University Museum of the University of Arkansas conducted archaeological investigations on the northern reaches of the White River in Arkansas. The area investigated will be inundated by Bull Shoals Reservoir now under construction by the United States Army Corps of Engineers. Survey work was first done in the upper part of the Bull Shoals Reservoir in the fall of 1946 by the University of Missouri, the Missouri Resources Museum and the Missouri Archaeological Society. General survey work was conducted in both 1947 and 1948 by the University of Missouri Summer Field Session and again in the spring of 1949 by the University of Arkansas, University of Missouri and the Missouri Archaeological Society. These surveys were under the direction of Professor Carl H. Chapman of the University of Missouri. Two students from the University of Arkansas (J. C. Tipps and James Sublette) accompanied the University of Missouri summer field party for the first few weeks for training in archaeological field technique and then spent the latter part of the summer doing survey and excavation in Arkansas. Field work by the University of Arkansas in 1949 was under the direction of Professor S. C. Dellinger, Director of the Museum, and conducted in the field by Mr. Lynn E. Howard, Assistant Director of the Museum. Mr. Howard

> was assisted in the field by Mr. J. C. Tipps, who had worked in that area in the summer of 1948. (Howard 1963:1)

The results of excavations conducted at three sites in Marion County, Arkansas are reported by Lynn E. Howard in *The Missouri Archaeologist* (Howard 1951), and this account was reprinted, with editorial changes and additions, in the *Bulletin of the Arkansas Archeological Society* (Howard 1963). Excavations at 3MR56 are reported in the *Central States Archaeological Journal* (Crumpler 1969). A brief description of excavation at 23TA12, as well as reference to excavations conducted by the University of Missouri at 23TA34 and 23OZ1 appears in Haslag (1946). Documentation of excavation, ranging from brief profile descriptions to complete field notes, are included in the ASM forms for 23TA11, 23TA12, and 23TA13.

The work in the Bull Shoals reservoir area was followed by a much more systematic and comprehensive program of site location and salvage conducted in the Table Rock Lake area. This program was led by Carl Chapman and resulted in the recording of over 1,000 site locations in the area and the excavation of numerous bluff shelters and a number of "open" sites. Numerous individual reports were made on these investigations. Many of these are included in the report filed with the National Park Service who sponsored this effort (Chapman et al 1960). The primary emphasis of this undertaking was on establishing the chronology of occupation and defining different cultural phases. This was done by the use of morphologically distinct projectile points, the basic seriation of which was created by Ray Marshall in his Masters Thesis from the University of Columbia (Marshall 1958). These investigations were the basis upon which Carl Chapman was to define the culture-historical sequence for the region (Chapman 1975; 1980). The culture-historical divisions Chapman proposed are still generally accepted by contemporary researchers:

Early Man
Paleo-Indian
Archaic (Early, Middle, Late)
Woodland (Early, Middle, Late)
Mississippian

While still primarily interested in refining the chronological range of the archeological record these earlier researchers provide some descriptions of the spatial distribution. The most succinct of these was given at the end of the initial reconnaissance level survey of the Stone County, Missouri, portions of Table Rock Lake when it was reported that "Evidences of campsites were found on almost every well-drained river terrace, bench, knoll or high bank adjacent to the larger streams" (Chapman, Maxwell, and Kozlovich 1951:12).

The work in Table Rock Lake was followed a decade or so later by a project in Beaver Lake conducted under the auspices of the University of Arkansas Museum. Like the work in Table Rock Lake, considerable effort was expended in the excavation of bluff shelters. Also like the work in Table Rock this effort was primarily concerned to establish chronology through the seriation of projectile points which appeared as a Masters Thesis from the University of Arkansas (Scholtz 1967). A description of the distribution of the archeological record mirrors that given earlier by Chapman.

> The great majority of the open sites occurred along the edges of the second terrace of the White River. Dissection by intermittent streams has cut the terraces into remnants paralleling the river or spurs whose length lies perpendicular to the river. Erosion has left many of them as gentle low ridges and it was along these terrace crests that the cultural material was concentrated, decreasing in quantity as one moved away from the highest portions of the site. In many cases it was difficult to determine where one site ended and another began. In areas where continuous stretches of the river terraces had been cultivated recently, long series of adjacent fields all showed evidence of Indian occupation. One received the impression that if all the river bottomlands had been freshly plowed, mile after mile of cultural material would have been exposed, divided only by gullies and streams. These topographic features were the sole criteria used in separating one site from another in a number of cases. (Scholtz 1967:19,20)

For our purposes there are a number of points to be made as we close this summary of the archeological investigations conducted up to the end of the reservoir salvage projects. The first point to be made is that the statements regarding the distribution of the archeological record were entirely impressionistic. This does not mean that these statements were wrong. It simply means that these were observations made in the course of investigating other things. No attempt was made to support these statements with detailed presentations of evidence.

Secondly, the distribution of the archeological record was understood in terms of things called "sites." Since everyone then knew what sites were there was no attempt to define them. While great energy was expended in locating and documenting sites there was little self-consciousness about the way in which one went about doing this. As a result these site-location efforts can only be replicated by investigators at a very general level.

For our purposes it is important to note that there was almost no energy expended in documenting the archeological record created by the Euro-American occupation of the region. This statement should not be taken as a criticism of these investigators. It simply reflects the prevailing understanding of that period; archeological sites were "Indian" sites.

Federal Land-Management

By the early 1970s the process of the transferal of hundreds of thousands of acres of private lands to public ownership and management had been largely completed. The largest of these land-managing agencies was the US Forest Service which administers hundreds of thousands of acres in the region in the Mark Twain National Forest in southern Missouri and the Ozark-St. Francis National Forest located primarily in northwest Arkansas. The Corps of Engineers found itself responsible for the management of tens of thousands of acres in the White River valley.

Among many other responsibilities, these agencies were charged with the management of those cultural resources located on lands under their management. The primary problem they faced (and still face) was that they did not know what these resources were or where they were located. Site location and investigation prior to impoundment had naturally concentrated on those locations which were to be flooded or otherwise in danger of serious damage. This meant that the non-inundated areas had gone largely uninvestigated.

Thus, to avoid damaging "historic sites," areas planned for the many different kinds of project developments had to be examined prior to project initiation. Often this was done by the physical examination, on a case by case, basis those areas to be impacted. Lee (1986a; 1986b) are examples of such efforts at Norfork and Bull Shoals lakes.

Such a strategy, however, was not suited to the development of longer term planning strategies and serious attempts were made by these various agencies to gain an overall perspective on the cultural resources under their management. To do this agencies commissioned a number of literature reviews and records searches which resulted in studies called generically "Overviews." The summaries of research cited at the beginning of this section are examples of such activities.

In addition to the creation of overviews, agencies began to commission field investigations which would not only document the archeological record in those areas actually examined but would provide reliable projections about the nature of the archeological record in other areas as well. As part of this type of effort the Corps of Engineers sponsored a number of projects called shoreline surveys. Beginning in the late 1970s several of these have been conducted for the Corps lakes of the White River valley. These include projects carried out at Beaver Lake (Bennett and Stewart-Abernathy 1980) and Table Rock Lake (Bennett 1987; Bennett, Ray, Gettys 1987). The two such surveys conducted at Norfork Lake and Bull Shoals Lake are of particular interest to us.

The Bull Shoals and Norfork Lakes Shoreline Surveys

In the summer of 1977 the USAED,LR sponsored shoreline surveys undertaken by the AAS at Norfork Lake (Padgett 1977) and Bull Shoals Lake (Novic and Cantley 1979). Padgett (1977: 1) provides an account of the circumstances surrounding the initiation of these efforts.

> In February 1977, when Norfork Lake reached one of its lowest levels in years, members of the Twin Lakes chapter of the Arkansas Archeological Society notified the State Archeological Survey office that archeological sites and cultural materials were being exposed along the lakeshore. The State Archeologist then alerted the Little Rock District, U. S. Army Corps of Engineers. During March, 1977, the Corps informed the Arkansas Archeological Survey that funds would be made available for archeological investigations at Norfork.

This lowering of the lake level was also the case in Bull Shoals Lake so that it was decided to conduct a similar set of investigations at that location as well. The shoreline survey of Norfork Lake was undertaken in May 1977 and those at Bull Shoals Lake were carried out in the summer of 1977.

The statement of research goals of the two projects are very similar.

> The research design for the Bull Shoals Lake shoreline sample survey proposed to provide more information on the nature and extent of the archeological resources in the area. Observations on the location of sites relative to environmental features and information on the chronology and the cultures represented in the area form a necessary base for building predictive models for future research and for cultural resource management of the lake. (Novick and Cantley 1979: 11)

> The Norfork Lake project was designed to develop, analyze, and consolidate information on the prehistoric use and occupation of the area in order to form a predictive model of site location and function and to assess the impact of the lake on the known, discovered, or predicted cultural resources. These goals should complement the Corps of Engineers management plans for Norfork Lake by providing data on the location and nature of individual sites, and by providing a preliminary basis for developing a management program to conserve the resources and/or to mitigate adverse effects of the lake and its operation, and for developing public interpretative programs. (Padgett 1977:9)

The Scopes of Work and survey strategies for these two projects were very similar.

> The Scope of Work...for this study called for a systematic survey of a 5% sample of the shoreline (approximately 50 miles). Such a systematic survey would provide minimum data on the cultural resources in the area. Initially, 50 points along the shoreline with an archeologist walking 2 miles in either direction were scheduled for survey. This plan was changed to 185 points (every 4 miles) with an archeologist surveying a 1/4 mile area at each point. This made it possible to survey every type of environmental zone along the shoreline and increase the probability of finding sites." (Novick and Cantley 1979: 11)

> The specifications of the agreement with the Army Corps of Engineers called for a systematic sample survey of approximately 10% of the shoreline of Norfork Lake. Since the shoreline is irregular in shape, the sampling technique as originally conceived consisted of establishing 50 quadrats around the perimeter of the lake (1 mi sections) and sampling 1 mile of the shoreline within each section. (Padgett 1977:13)

The survey tactics used to implement this strategy were also very similar. The "environmental features" chosen to be correlated with site location are not defined in the report; although in the report conclusions the results of this correlation is given in terms of something called "topographic settings." Readers are, however, assured that the field work was sufficient to sample all of the environmental variability within the project area.

The survey was accomplished by two crew members using a truck and a 15 horsepower engine on a flat-bottom boat. Several different survey methods were employed, depending upon the amount of exposed shoreline at each stop....

On large exposed terraces both crew members walked in the same direction, one close to the present lake level and one higher up on the terrace. The return trip to the boat was made with one individual at the tree line and the other at a slightly lower elevation. In other instances, a zig-zag pattern was followed. Here one individual started close to the water, walked diagonally up the slope to the tree line and then proceeded diagonally down the slope to the lake. This same pattern was repeated, followed by a return trip along the tree-covered ridge or along the water. Another method involved walking near the water and returning at a high elevation. Sheer bluffs were eliminated from the survey, but, where feasible, the crew members boated around the bluff and walked up a more gently sloping side or back to the bluff top. When grass completely obstructed the view of the ground, small shovel pits were dug. Occasionally more than a quarter mile area was surveyed." (Novick and Cantley 1979: 12)

The surveyed portions within each section were selected in the field on the basis of topography and access. Areas along the shoreline with the slopes of approximately 45 or greater (100% grades) were eliminated from consideration, since these areas were usually eroded to bedrock or talus. Access to the shoreline was a problem in developed areas where marinas, boat docks, ferry landings, and residential areas altered or obscured the shoreline. Mallard Point was excluded due to private ownership of lakefront property in this area. As a result, some sections were not surveyed in contiguous mile long strips, but several shorter strips per section were surveyed, and some of the original quadrats were excluded from the survey altogether. (Padgett 1977: 13)

As part of his description of survey techniques Padgett provided readers with a definition of a site. " Because of the large amount of natural chert shatter, a fairly conservative site definition was used and areas were not designated as sites unless at least three flakes (with evidence of distinct striking platform and/or bulb of percussion) or tools such as biface fragments were found" (Padgett 1977: 14). No indication of how sites were defined is given in Novick and Cantley (1979).

At the end of the report the results of this effort to interpret the distribution of the 69 sites they recorded in terms of the environmental variables measured are given in a single paragraph accompanied by a table. They found that, "The archeological sites were found on almost all topographic settings in the Bull Shoals area, but the majority (72%) were situated on terraces whether on the White River or on tributary feeders" (Novic and Cantley 1979: 79).

Table 7 (Novic and Cantley 1979: 79) informs us further than 20% (N=13) of the archeological sites were discovered on ridgetops and 8% (N=5) were discovered in the floodplain.

The goals of the shoreline survey of Norfork Lake were similar to that of the effort undertaken at Bull Shoals. Padgett (1977:13,14) provides us with a statement of the objectives and methods of the Norfork Lake shoreline survey.

Eight of the 11 archeological sites which had been recorded previously were revisited, and three other sites which were known to amateur archeologists, but had not been recorded were inspected and recorded. In addition, six COE "primitive" camping areas, opened to the public in mid-May, were surveyed as part of the total sample.

The total amount of shoreline surveyed intensively was 40 miles, which constituted 7.8% of the shoreline at the top of the flood control pool or 10.5% of the shoreline at the top of the conservation pool.

Access to the sample tracts was gained by boat and, in a few instances, by truck. The usual technique employed was to beach the boat in the middle of the tract to be surveyed; one person would walk the beach in one direction while the other person walked the opposite direction. When each person reached the end of this portion of the tract, he would turn around and return to the boat by a route 5 to 7 m higher on the shoreline.

Padgett divided the landscape into north facing slope, south facing slope, east facing slope, west facing slope, terrace, ridgetop, and slope above terrace (Padgett 1977:43). While no conclusions were drawn directly about the distribution of sites across this landscape Table 5 (Padgett 1977: 43) shows that sites were located on all of these divisions and, as was the case in Bull Shoals Lake, most were located on terraces.

In contrast to Novic and Cantley (1979), Padgett (1977:35-37) divides the archeological record into two different types of sites. These are Base Camps and Specialized Activity sites.

> The Norfork Lake prehistoric sites can be grouped into two categories based on postulated site function: base camps and specialized activity sites. Base camps, as used here, refer to large sites with artifacts representing a wide range of behavioral activities. .. Specialized activity sites are sites established for a short period of time.. for a specific activity such as hunting or manufacturing lithic tools...
>
> Specialized activity sites produce a different archeological record than base camps. These differences will be both quantitative (number of artifacts, extent of artifact distribution on the surface) and qualitative (variety of artifacts represented), although the latter is probably more significant.

A summary of the distribution of these various kinds of sites is given in Padgett (1977:51).

> 1) Throughout prehistory, the bluff shelters near the river and its major tributaries were selected as optimum site locations, providing shelter, proximity to food resources, and often providing good views of the countryside from the shelter or the top of the bluff.
>
> 2) Terraces of the river and major tributaries were selected for occupational sites (base camps and villages) probably year round but especially in late spring and summer.
>
> 3) Specialized activity sites, such as hunting camps, observation stations, and lithic procurement sites were located primarily on ridge tops and slopes. Hunting camps or lithic procurement sites may also be located in the bottoms, but later occupation of the same loci will usually obliterate their archeological record (unless stratigraphically sealed).
>
> 4) Northern slopes were usually not selected for occupation. Sites found in these locations were probably specialized activity sites occupied in summer and fall.
>
> 5) Use of the broader terraces or the river for base camps and villages increased with the dependence upon cultigens as a major portion of the diet but hunting and gathering of wild foods was never abandoned as the primary economic pursuit.

In summary, these surveys documented 64 previously unrecorded sites (two of which were historic) at Bull Shoals Lake (Novick and Cantley 1979: 79) and 27 previously unrecorded sites (only one of which was entirely historic) at Norfork Lake (Padgett 1977: 51,52).

While these efforts continued to provide data supporting the clustering of sites in terrace locations they also demonstrated that the archeological record was not restricted to those locations. The archeological record was also present on hillslopes and summits. Further, Padgett's analysis suggested that there might be a difference between the type of archeological record present on terraces and that found on the hillslopes and summits.

These observations were, however, restricted to the archeological record created prior to the Euro-American settlement. While these efforts did record historic period sites it is clear that only a small portion of this portion of the archeological record was documented. Indeed, Padgett (1977: 52) pointed out the documentary evidence for the hundreds of farms and communities which had existed in the project area prior to impoundment. By and large, however, these efforts to document the distribution of the archeological record still remained primarily concerned with the pre-Euro-American segments.

Finally, it is important to note that these efforts were much more self-conscious about their site location strategies and techniques than the earlier efforts we have noted. Further, we find in Padgett (1977) the first definition for site.

The Ozark-St. Francis National Forest Weddington Unit Study

A few years later a much more ambitious effort to understand the distribution of the archeological record in the Ozarks was undertaken in the Ozark-St. Francis National Forest. The primary goal of this effort was, in the words of the Principal Investigators, "to evaluate the nature and distribution of prehistoric and historic archaeological sites in the Weddington Unit of the Ozark-St. Francis National Forests" (Sabo and Kay 1982: 3)

The area in question was a block of land containing about 20,000 acres within which the US Forest Service actively managed about 12,000. This area is situated in the Illinois River drainage of Benton and Washington counties in northwest Arkansas.

This effort was undertaken for the Ozark-St. Francis National Forest as a joint project of the Department of Anthropology of the University of Arkansas at Fayetteville represented by Marvin Kay and the AAS represented by George Sabo.

Field investigations were divided into three types. First investigators revisited 19 of 24 previously recorded sites in the area. The second phase of fieldwork involved a reconnaissance level survey. It consisted of "walking all of the access roads, powerline maintenance paths and newly plowed fields within the Forest. Road and stream cuts were also examined for buried soils and sites." (Zahn 1982: 47)

The third phase of field work involved the pedestrian examination of nine randomly chosen transects measuring 100 x 1000m which comprised ca. 1.5% of the area. These transects, established by tape and transit, were examined by shovel testing at grid locations placed at 50m intervals within the transect. Additional shovel testing to establish site limits was also conducted (Zahn 1982: 48; Sands and McKelway 1982).

During the examination of these transects,

> Sites were designated by one or more shovel tests yielding cultural material (minimum requirement: 1 flake). Tests containing material that could possibly be cultural were included within site boundaries if they were in association with a definite site/test, if this was warranted by the topographic settings of the tests. (Sands and McKelway 1982: 92).

This study recorded information about 76 prehistoric sites of which 24 were composed entirely of a single item; 16 of which consisted of a single flake.

In an attempt to understand the distribution of these sites several environmental variables associated with site location were considered. These were site elevation, distance to the nearest stream, slope of ground surface, stream rank, soil type and drainage network (Kay and Sabo 1982: 5). The results of this effort are summarized in a number of places.

> In summary, this analysis showed that the floodplain of the Illinois River, its major tributaries, and immediately adjacent stream terraces and plateaus are <u>most likely</u> to contain prehistoric artifacts. However, <u>no specific topographic setting can be identified as being devoid of archaeological sites</u>. (Sabo and Kay 1982: 5)

> To summarize, this analysis shows that areas of the floodplain of the Illinois River, its major tributaries, and immediately adjacent stream terraces and plateaus have a high probability for prehistoric sites; however, we cannot specify any particular topographic situation as being devoid of archeological sites. (McKelway 1982: 131)

> The results of this simulation study ... shows that locational patterning in the empirical data set (i.e., those sites identified during the three phase archeological survey) is consistent with randomly distributed data, with two important exceptions being noted. These are: 1) sites located in the 290 to

> 320 m floodplain elevation level; and 2) sites located on Healing soils (which occur in river floodplains) and on Enders-Allegheny soils (which are predominately associated with mountainsides). The general correspondence between the empirical and simulated (random) data sets may, however, be due at least in part to the very small sample fraction (1.5%) of the Weddington Unit addressed by the survey and simulation study. ...
>
> Thus the "patterning" one may reconstruct from the empirical data share many but not neccssarily all features with randomly configured geographic locations. (Sabo and Kay 1982: 5, 6)

> To summarize, the results of the simulation study indicate that the samples of surveyed sites are, in the main, consistent with randomly distributed data, with the exceptions of lower elevation and soil series relationships for the empirical sites. Due to the relatively small sample of total area encompassed by either selected transect or random simulation transect data (1.5%), the validity of these results is subject to further review by a more extensive transect sampling program. (King 1982: 146)

> The primary differences between the empirical and simulation data are in site elevation and associated soil series. Stated in its simplest form, there are significantly more sites along the floodplain of the Illinois River and its tributaries and within the Healing soil series than would be expected by chance alone. Yet, in other respects the simulation does correspond to a high degree with the empirical sites distribution. (Kay and Sabo 1982a: 148)

> Further, upland site context generally are indicative of shallow sites which may or may not have considerable time depth. Sites within the floodplain of the Illinois or its tributaries may also be shallow surface scatters of debris. But they also have the potential for deeply buried, multilayered units. (Kay and Sabo 1982a: 148).

> There were few artifacts of diagnostic value retrieved in this survey. We were not able to delineate site extent sufficiently through shovel testing. We are not able to make statements about site placement through time or site function because we presently lack both the artifacts and their contexts within finite site areas. In sum, we do not have the tool assemblages to define site function nor, in most cases, the diagnostic artifacts to define cultural affiliation. (McKelway 1982: 125)

The results of this effort mirror those of the shoreline surveys; that is, while the archeological record, as measured in terms of sites, can be found almost in every setting it seems to be clustered more densely in alluvial settings.

This work also included the cutting of a backhoe trench within the floodplain of Wildcat Creek in order to investigate the structure of that portion of the landscape (Kay and Sabo 1982b) and this work, along with other observations, indicated the presence of portions of the archeological record buried in alluvial settings.

Finally, we note that even though the stated attempt was to understand the distribution of both the prehistoric and historic period archeological record the effort provided no data on the distribution of historic period sites.

The Mark Twain National Forest Inventories

Another, much more extensive effort to understand the distribution of the archeological record has been undertaken in the Mark Twain National Forest. Carried out over several years by the CAR, this effort has attempted to integrate the inventory efforts of the Mark Twain National Forest into an interpretation of the landscape (Benn and Purrington 1985; Ray and McGrath 1988). To date, over 40,000 acres have been examined.

Basing their classification system primarily on slope geometry, these investigators divided the landscape into five basic landform types. These were Summits, Shoulders, Backslopes, Footslopes, Toeslopes, and Benches. Summits were later divided in Interfluve Summits and Divide Summits and the area just downslope of the hillcrest, the Shoulder, was added to form a single unit called Summit/Shoulder. By and large the units Summits, Backslopes, and Footslopes correspond to the landforms used in this present study under the terms Summits, Sideslopes, and Footslopes. Toeslopes, the level termination of the hillslope complex, may or may not be composed of alluvial sediments.

In this effort a distinction was made between archeological sites, isolated finds, and historic features. For our purposes the differences between sites and isolated finds is important. Sites were defined as two or more culturally altered artifacts discovered in what was judged to be a primary context. Such locations were reported to the ASM and the Mark Twain National Forest to be assigned ASM numbers. Single artifact locations were noted but not registered with the ASM as sites.

The following paragraphs summarize the investigators conclusion regarding the distribution of the archeological record in the areas examined.

> For the prehistoric periods we have only cultural age to compare in terms of settlement patterns. In this regard the data do not accurately reflect what landforms were selected or avoided by peoples during various periods, but the data do reflect how much we know about categories of sites. For instance, almost 91% of the 22 sites on toeslopes are known to be affiliated with one or more cultural periods, but only 13.6% (16 of 118) of the sites on all other landforms combined can be affiliated with some cultural period! Thus, the fact that prehistoric peoples preferred interfluve summit/shoulders, footslopes, toeslopes, and benches for occupation is not very revealing about settlement patterns, since the relative age(s) and function(s) of the sites are not well documented. (Benn and Purrington 1985: 1007)

> The breakdown according to prehistoric period (i.e. Dalton through Mississippian) shows no definite pattern of sites (sic) distribution on the landforms. This illustrates the central problem of the MTMF (sic) data...; that too few of the known sites are associated with a specific culture or temporal period. In part, this is a methodological issue. Investigation at the survey level does not collect the data requisite for making these types of determinations.

> Other simpler settlement patterns evident in the .... data have to do with *site function. The prehistoric* site types, campsites and lithic procurement/knapping stations, have different distributions. Campsites tend to be concentrated close to larger valleys: i. e. on the ends of interfluves and on valley landforms (i. e. footslopes, toeslopes, and benches). Lithic stations occur most frequently on summit/shoulders of the uplands but are also present on footslope and toeslope positions of low order tributary streams. The uplands and low order (intermittent) stream valleys are places where natural chert is most abundant and accessible to knappers. (Ray and McGrath 1988:139-141)

CAR has summarized its data into a tabular format which allows comparison of the number of sites recorded with the number of acres examined. Tables 2 and 3 summarize these results for pre-Euro-American sites.

Table 2. Site Distribution in the Mark Twain National Forest*
(Pre-Euro-American Sites)

Landform Unit	Acres Surveyed	Sites Recorded
Summit/Shoulder	13,699 (34%)	96 (43%)
Backslope	22,436 (55%)	16 (07%)
Footslope	3,402 (08%)	56 (25%)
Toeslope	852 (02%)	28 (13%)
Bench	322 (01%)	26 (12%)

* Data from Ray and McGrath (1988:136)

Table 3. Ratio of Acres to Sites: Mark Twain National Forest*
(Pre-Euro-American Sites)

Landform	Acres per site
Divide Summit/Shoulder	106
Interfluve Summit/Shoulder	183
Backslope	1,447
Footslope	61
Toeslope	30
Bench	12

* Data from Ray and McGrath (1988:136)

These data provide additional support for the observations made earlier. Clearly the archeological record created by the occupants of the region prior to the coming of the Euro-Americans is distributed across the entire landscape. Further, there is a difference between the scatter of lithic materials across the upper portions of the landscape (summits and backslopes) and that found on the lower portions of the landscape. This difference was expressed in terms of the inferred activities conducted there. Padgett expressed this as a difference between special activity sites and base camps while Ray and McGrath expressed this as a difference between lithic stations and campsites.

As was the case in the Weddington Unit Survey investigators reported a general lack of culturally or chronologically diagnostic artifacts; particular on the upper portions of the landscape.

These inventories also considered the placement of 139 historic period sites in the region although not all were recorded as a direct result of Mark Twain National Forest inventories (Ray and McGrath 1988: 143)

> Over 70% of the historic components are residential areas, presumably occupied by individual household groups. The majority of these (50%) occur on interfluve summit/shoulders, while 27% occur with relatively equal frequency on footslopes or benches. Most of these residential sites can be dated to the late 19th through early twentieth century. It is tempting to link this distribution to the development of transportation networks and shifts to commercial agriculture with residential loci on farmsteads positioned so as to provide maximum amount of arable land and access to roads... However, consideration should also be given to the impact that extractive industries (timber and mineral) had upon late 19th and early twentieth century settlement systems in the Ozark region. (Ray and McGrath 1988: 141)

Summary

In reviewing the history of the effort to document the distribution of the archeological record in the region we can see certain very clear trends. The effort to record the archeological record has now spread to all portions of the landscape and has expanded to include the archeological record created during the last 200 years; at least the archeological record created 50 or more years ago.

Not only has this effort expanded to all portions of the landscape, it has become increasingly more self-conscious in the design of its activities. Such efforts now require an increasingly sophisticated understanding of the landscape. Field work is conducted in such a way that others can replicate the activities undertaken. Further, while all such projects have recorded their results in terms of discrete units called sites, it has become necessary for investigators to provide their colleagues and sponsors with a definition for this term. It is interesting to note that while "sites" still remain the principal units of analysis used to document the archeological record there is no consensus among investigators regarding its definition.

The pre-Euro-American archeological record documented thus far is composed primarily, almost entirely, of scatters of lithic artifacts across the landscape. While there are certainly some elements of the built environment constructed prior to the coming of the Euro-Americans in the region none were recorded by the investigations considered above. These investigations have shown us, however, that the scatter of lithic debris is almost ubiquitous and can be found on almost every segment of the landscape. The differences in this scatter are not so much in kind as they are in number; an issue we explore in greater detail below.

The data gathered to date clearly supports Bushnell's 1903 observation that the pre-Euro-American archeological record is concentrated on the alluvial structures along the streams. While it has also been known since Schoolcraft's early 19th Century account that significant portions of this record lie buried in these alluvial structures there has been almost no effort designed to investigate this "third" dimension of the archeological record's distribution.

In contrast to the earlier archeological record the distribution of the Euro-American archeological record remains basically undocumented by archeological investigations. This situation is changing rapidly, however. In contrast to the documentation of the earlier archeological record, that portion of the Euro-American archeological record which has been recorded to date consists primarily of the remains of the Euro-American built environment.

With this background we now proceed to the analysis of the landscape and the distribution of the archeological record of Bull Shoals Lake and Norfork Lake conducted by this project.

CHAPTER 3. THE LANDSCAPE

The early settlers and travelers to the White River valley brought back with them stories of a land of remarkable scenic beauty. Consider the description offered by Henry Schoolcraft of the view he and his companions had from

> the top of a commanding precipice which overlooked the valley of White River, with the heavy-wooded forest, the towering bluffs on its south-western verge, with the river winding along at their base, and the hunters' cottages indicated by the curling smoke among the trees, in plain perspective. Joy sparkled in every eye; we stood a moment to contemplate the sublime and beautiful scene before us, which was such an assemblage of rocks and water--of hill and valley--of verdant woods and naked peaks--of native fertility and barren magnificence, as to surpass the boldest conceptions, and most happy executions of the painter's pencil, or the poet's pen. (Park 1955: 127)

In his widely circulated geography Timothy Flint describes the White River in this way.

> White river has its sources in the ridge called the Black Mountains, which divides its waters from those of the Arkansas. Its northern and eastern branches almost interlock with the western ones of the Osage, Maramec, and St. Francis. The western branches rise, and run a long distance in Missouri. It enters this territory (ed. Arkansas), at its north-western angle, and receives the very considerable tribute of Black river. The western branch is composed of Little Black, Currant river, Thomas' Fork, Red river, Spring river, Strawberry, and other streams, which run through a pleasant, healthy, and fertile country, abounding in pure springs and brooks, and furnishing great numbers of mill seats. ...Below the junction of the western branch, the main river receives Red river, Eau Cachee, Big Creek, and some others. It is called in its Indian appellation by a name denoting White river, from the transparency of its waters, compared with those of Arkansas and the Mississippi. It is uncommonly circuitous in its course, winding three, or four hundred miles to make one hundred in direct advance towards it debouche. (Flint 1828: 577).

Flint also provides us with a description of that portion of the White River with which we are concerned in this study.

> There is a large tract of country, on the upper waters of White river, which has sometimes been denominated New Kentucky, either from its being fertile, rolling, and abundant in lime stone springs or from its being congenial to the staple products of Kentucky, than the country lower down. It is sheltered in the north by mountains. The fertile tracts are valleys embosomed between high hills; and the productions of the north and south for the most part succeed in this soil. It has one great inconvenience. The streams, that run among its precipitous hills, receive the water of the powerful showers that occasionally fall, and pour these waters from a hundred shelving declivities into the streams. They have been known to rise forty feet in perpendicular height, in a few hours. The standing corn and cotton is submerged; and the hope of the year destroyed. (Flint 1828: 573)

The following pages offer a somewhat more prosaic description of the landforms and landforming processes present within our project areas.

Physiography and Geology

Both the White River and the North Fork River, along with their tributaries, are located within the Ozark Plateau physiographic province. The Ozark Plateau occupies the greater part of Southern Missouri and Northern Arkansas and is a geologically stable area, composed primarily of Paleozoic age and older rocks. This physiographic province is subdivided into the St. Francis and the Boston Mountains and the Springfield and

Salem Plateaus. The study area is situated within that portion of the Salem Plateau composed primarily of Ordovician age sedimentary rocks.

The White and North Fork rivers and their tributaries have incised and formed well-defined drainage basins in the Ordovician age sedimentary rocks (Figures 10 and 11). The sedimentary rocks are primarily cherty dolomites. These sediments dip gently due south at less than three degrees. The Cotter Dolomite and the Jefferson City Formations are the principal formations exposed throughout much of the project area. These two formations are best exposed in the headwaters of the Bull Shoals Reservoir at Forsyth, Missouri.

The basal unit in the valley walls is the Jefferson City Formation, consisting of cherty, gray to brown silty dolomite. The Jefferson City Formation at Forsyth is approximately 200 ft thick (Thomson 1982). Overlying the Jefferson City Formation is the Cotter Dolomite, consisting of silty gray to brown cherty dolomite with lenses and locally persistent sandstone beds. Thomson (1982) has identified the Cotter Dolomite as ranging from 100 to 150 feet thick at Forsyth. Both formations contain cherts which are oolitic and white, gray, or black.

In addition to the Jefferson City and Cotter Dolomites, two other formations are exposed in the project areas, but they are of minor importance. The Powell and Everton Formations are exposed in the upper parts of the tributary valleys, near the central and southern margin of the project area. The Powell Formation overlies the Cotter Dolomite and is composed primarily of cherty dolomite with thin sandstone beds. The Everton Formation overlies the Powell Formation is composed primarily of uniform, fine-grained silica sandstone with occasional lenses and thin beds of limestone and conglomerate.

Geomorphic Setting

The drainage basins of the White and North Fork rivers have been evolving since at least the Tertiary Period when the Ozark Plateau began uplifting in response to continental tectonism (uplift). These major streams and their tributaries have been downcutting into the underlying sediments and widening their valley walls since the time that a drainage basin began forming on the underlying Ordovician age sediments. These systems have evolved not only in response to the tectonism, but also changing environmental influences (primarily major climate changes) that have been operating during this time as well.

Changes in climate are short term occurrences relative to the long duration of geologic time that has elapsed between deposition of the Ordovician age sediments and the beginning of the White River drainage basin. However, changes in climate have resulted in major changes to these drainage basins during the geologically brief period of Pleistocene glaciation in North America. Glaciation and glacial drainage were not directly connected to these systems, located near the southern limit of the glacial maxima, and there are no recorded glacial sediments in these river valleys. The geologic record indicates that the major effects of northern glaciation to the study area were indirect, primarily through climatic influences.

Climate changes in the White and North Fork river systems are reflected primarily in changes in precipitation and vegetation. Significant changes in precipitation govern the rate at which valley-wide erosion occurs and the quantity of sediment transported to the fluvial system. Vegetation changes occur in response to the different temperature and precipitation characteristics and new vegetation species become dominant shortly after these changes occur. Maximum erosion and downcutting will occur following a sudden climate change when vegetation stress is at a maximum and hill slopes are responding to the different precipitation and erosion levels. Eventually, as new species of vegetation become adapted to the landscape, the erosion rate decreases and the landscape attains equilibrium with the new climatic conditions.

During the Pleistocene there occurred numerous and sudden climate changes in the Ozark Plateau region as the continental glaciers repeatedly advanced and retreated across North America (Flint 1971; Wright and Frey 1965). One can only speculate on the specific changes to drainage basins such as the White and North Fork rivers that were brought about by the shifts in climate. It is believed that each time there was a climate change, related to a major glacial advance or retreat, there may have began a new cycle of erosion and/or deposition within the valley. The result of each new cycle was to create a new floodplain surface that reflected the existing

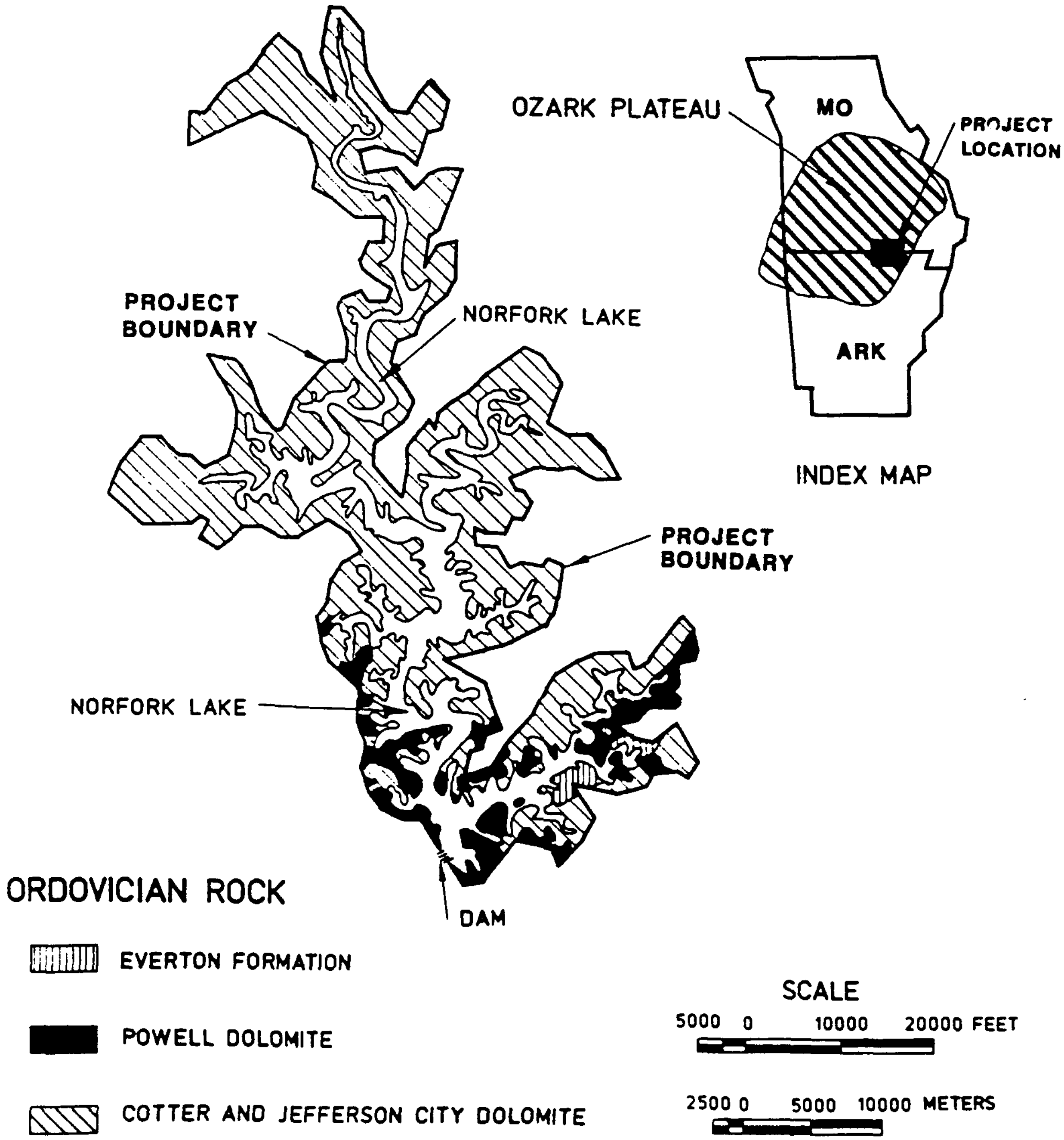


Figure 10. Geologic Setting of Norfork Lake

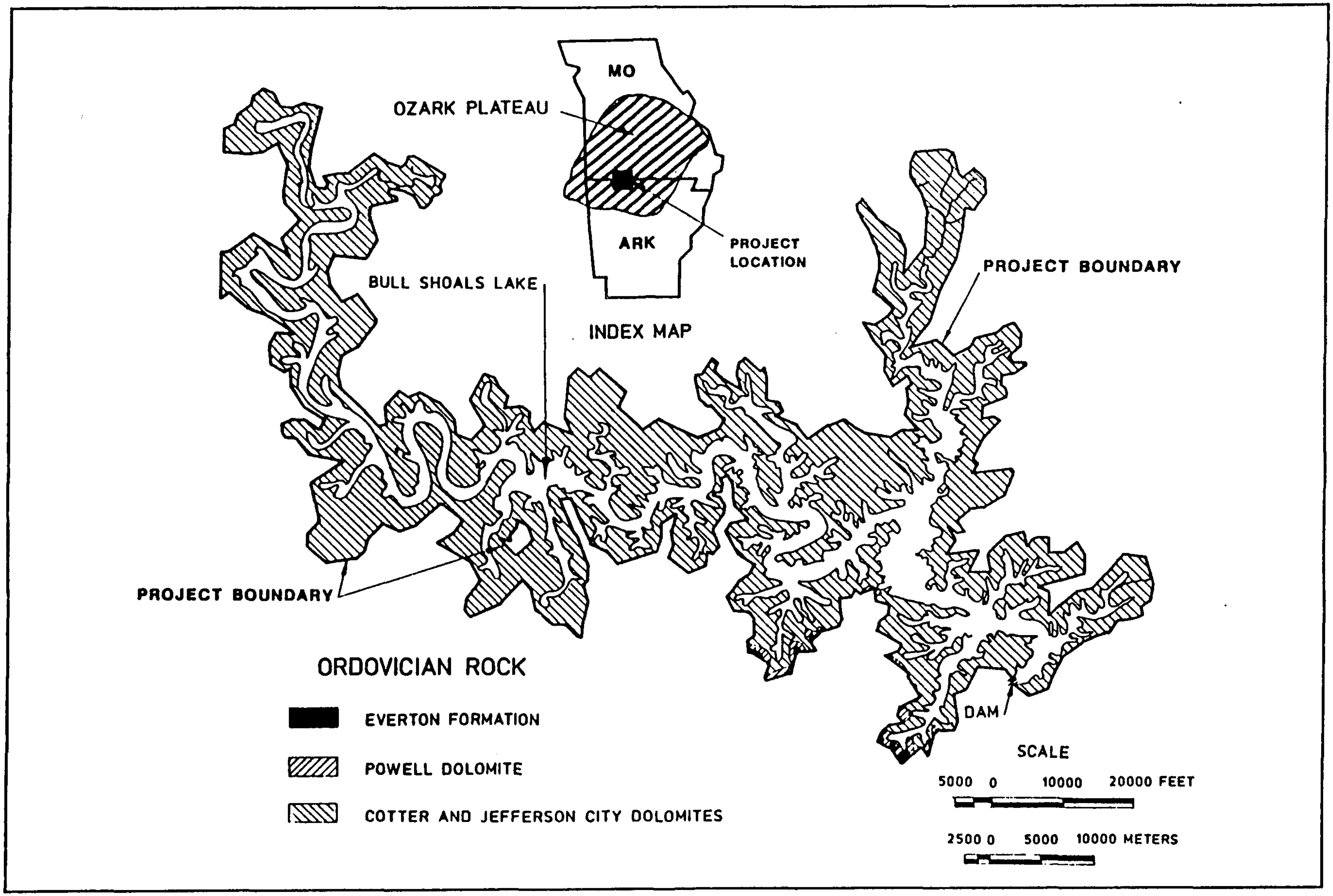


Figure 11. Geologic Setting of Bull Shoals Lake

climate and system characteristics. The new floodplain surface formed either above, below, or at the same level as the previous floodplain surface. In this connection it is important to note that cycles of erosion and deposition may also occur by mechanisms other than major climate shifts. Floodplain aggradation and degradation may occur from variability within specific climates as geomorphic thresholds in the system are exceeded or from man-made impacts to the system.

The net effect of both long and short term tectonic and climatic activity in the White and North Fork drainage basins has been the creation of a well-established fluvial system that has downcut to its present level and formed a relatively narrow valley. Erosional and depositional remnants of the White River's path to its present position are preserved in the present valley walls. These fluvial remnants are terraces formed from alluvial sediments (depositional type terraces) or river cut, flat topped rock benches (erosional or strath type terraces) that are above the present floodplain. Multiple terrace levels are preserved in the White River drainage basin, both depositional and erosional type terraces.

The project areas, therefore, contain two different geomorphological systems which must be considered in the analysis of the landscape; the Hillslope Geomorphic System and the Fluvial Geomorphic System.

Hillslope Geomorphic System

Introduction. It is not the purpose of this study to examine in detail the characteristics and processes of hillslope systems. It is necessary, however, to identify important concepts and processes of the hill slope system as it relates to the project area. A more detailed presentation of hillslope systems can be obtained in a number of good reference texts on the subject (e.g., Fairbridge 1968; Carson and Kirkby 1972; or Leopold, Wolman, and Miller 1964).

Many different geomorphic processes are responsible for the creation of a hill slope. The shape of a hill slope is determined by the relationships between the weathering of the underlying parent material and the transport of the weathering products down slope, usually to a fluvial system at the base of the slope. Weathering is the basic mechanism by which the underlying rock is decomposed and disintegrated. It encompasses both chemical and physica' processes. The main transport agents of the weathering products are running water, ice, wind, mass movements, and biological disturbances. These different processes have been ongoing in the project area for millions of years, at least since the beginning of the Tertiary Period when the Ozark Plateau was uplifted.

Weathering. Physical weathering (disintegration) occurs by a wide variety of methods. The methods include impact and abrasion of particles from the action of running water and wind, ice and freeze-thaw relationships, differential mineral expansion from temperature variability, wetting and drying phenomena, and organic activity. An important organic activity in physical weathering is bioturbation, biologically produced soil and rock disturbances. These disturbances include the movements of burrowing organisms and root growth.

Chemical weathering (decomposition) involves complex chemical reactions between the earth's materials and the earth's atmosphere and hydrosphere. These reactions result in the decomposition of the underlying rock and the formation and development of a soil profile. The final product of these various chemical reactions is the reduction of rock to clay minerals and the liberation of soluble ions. Vegetation is another major factor in the chemical weathering process by facilitating organic acids formation from the decayed vegetation and thereby affecting soil pH. The organic acids form weak solutions which contribute to rock decomposition. The rate at which chemical weathering occurs is a function of the composition of the parent material and the climate. Climate governs the available precipitation and controls the temperature of the earth's atmosphere and the earth materials in contact with the atmosphere. Other factors affecting chemical weathering rates include the length of time during which weathering has occurred and topography (slope) of the area.

Sediment Transport. The main agents of sediment transport in the project area are running water and mass movements. Precipitation erodes the surface materials by forces produced from rain impact and by the movement of surface water. The movement of surface water will occur first by sheet wash, the downslope movement of surface water as a thin continuous layer. This water begins to erode tiny rills into the ground surface, which at a point downstream, merge into and form a permanent drainage gully. The gullies combine to form a larger-scale intermittent stream channel. These seasonal flowing channels in turn combine to join a permanent stream that is capable of forming a floodplain. At some point downstream, the drainage collects into a major stream channel such as the White or North Fork rivers. The rills, gullies, various intermittent and permanent streams, and the major channel collectively form a drainage basin.

Sediment transport by mass movements is less frequent than by precipitation events. However, mass movements, as the name implies, involves the transport of large volumes of earth materials rather than the movement of single particles during a precipitation event. Fairbridge (1968) identifies two basic classes of mass movements. The first class of movements are surface movements which simply transfer debris down slope in a layer over bedrock. The major type of movement in this class is soil creep, the imperceptible movement of materials downslope under the influence of gravity.

The second class of movements are deep-seated, involving the underlying parent material, and they occur generally at a much faster rate. A general classification of deep-seated mass movements is presented in Figure 12. There are two general types of deep-seated mass movements, flows and slides. The type of mass movements is a function of slope angle, composition of the earth materials, moisture content of the earth material mass, and the vegetation characteristics of the hill slope. The main driving forces behind these movements are gravity and climate. Each of these different types of weathering and sediment transport mechanisms has occurred in the project area during the geologic past. These different processes are occurring presently and they will continue to occur.

Slope Form. There are three basic components to a hill slope as illustrated in Figure 13; a convex crest or summit, a straight or rectilinear side slope, and a concave foot slope (Fairbridge 1968). The three components can combine to form complex slopes that reflect characteristics about the underlying geology and the geomorphic processes that are operating. The geomorphic classification that was used to map the project area is based on slope form as a function of slope angle or percent slope. The primary mapping units of the hill slope system are summits, side slopes, and foot slopes. Associated with each of these landforms are specific geomorphic processes which are identified in Table 1.

The shape of the hill slope system has been studied in great detail by geomorphologists for the past century. It is an area of geomorphic research where total agreement has yet to be reached between slope form and the specific types of processes that are responsible for these geomorphic shapes. For purposes of this study, it is important to understand that the basic processes described in this section and identified in Table 2 are interacting with each other and the hill slope system to produce a characteristic profile shape.

Fluvial Geomorphic System

Floodplain Definition. A precise definition of a floodplain is important to this study because the terrace boundaries indicated on the 1:24,000 maps were partially determined by the limits of the pre-impoundment floodplain. A definition of a floodplain can have many meanings depending on the individual's perspective. Fairbridge (1968) identified the problem of defining a floodplain and described it as follows:

> To define a flood plain depends somewhat on the goals in mind. As a topographic category, it is quite flat and lies adjacent to a stream; geomorphologically, it is a landform composed primarily of unconsolidated depositional material derived from sediments being transported by the related stream; hydrologically, it is perhaps best-defined as a landform subject to periodic flooding by the parent stream. A combination of these perhaps comprises the essential criteria for defining the flood plain.

The basic definition of a floodplain as defined by Fairbridge must contain three parts; it must contain elements of topography, geomorphology, and hydrology.

The hydrologic criteria for defining a floodplain must incorporate flood frequency as part of the definition and it becomes the area of the river valley that is subject to inundation by the annual flood or the highest discharge during the year. The question then becomes, "What is the average annual flood?." To resolve this problem, average annual flood is expressed by flood frequency and a probability distribution or recurrence interval.

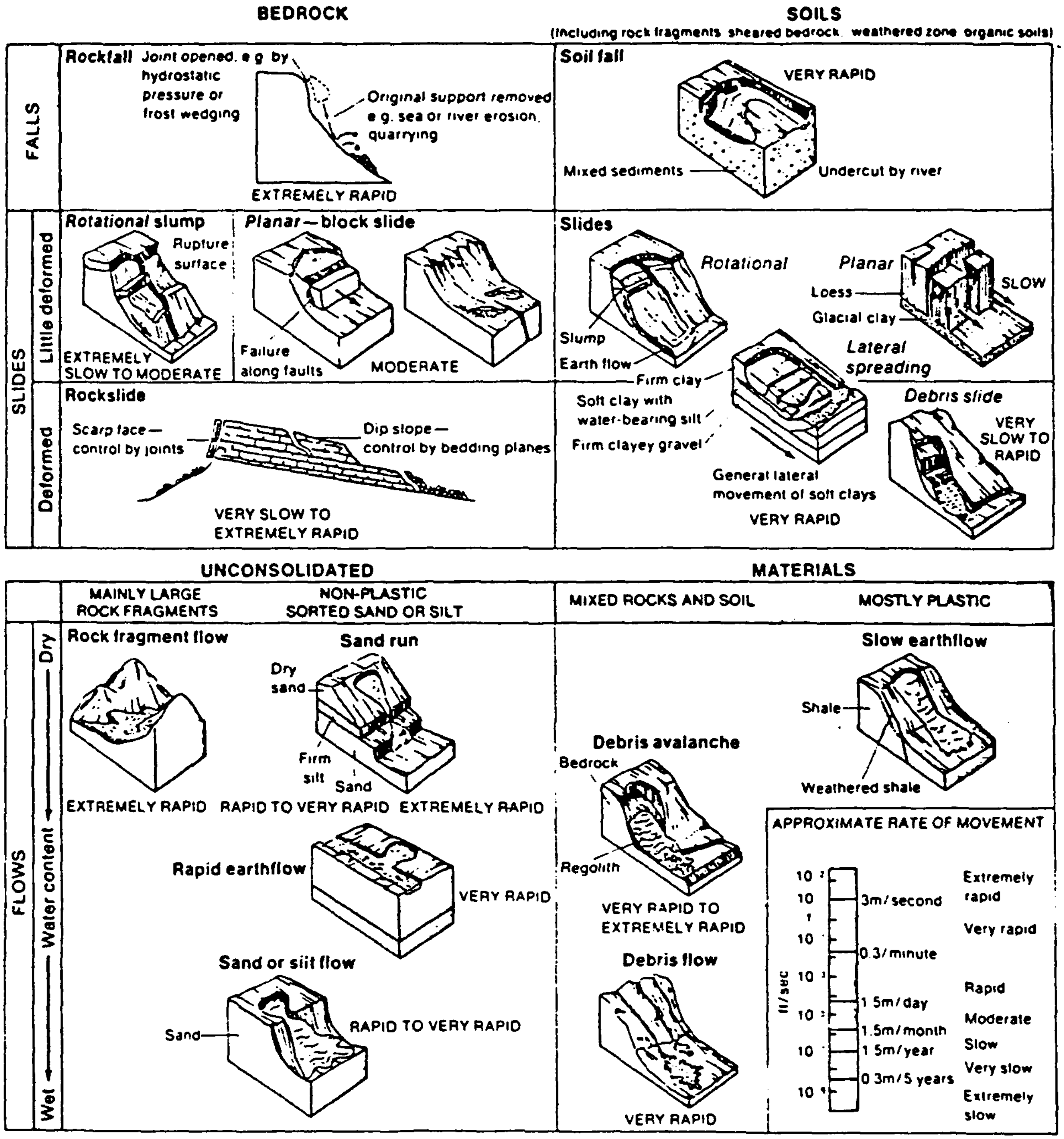


Figure 12. A Classification of Deep-Seated Mass Movements

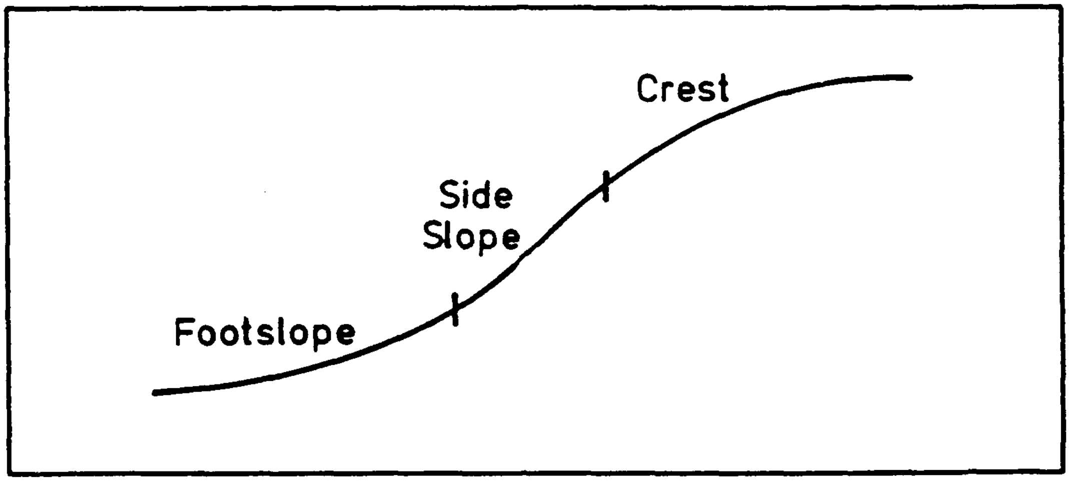


Figure 13. Hillslope Components

Leopold, Wolman, and Miller (1964) suggest that a flood frequency of one to two years should be used as the basis for defining a river's floodplain.

The definition of a floodplain as used in this study is that area of the river valley that is subject to inundation by a flood with a recurrence interval of two years and it must meet the topographic and geomorphic criteria described above in the Fairbridge definition. Also implied by this definition is a stream channel that flows throughout the year.

Defining Floodplain Limits. The procedure used to establish the limits of the floodplain area is based on flood frequency data from USGS stream-gage stations in and adjacent to the project area. At these stations the USGS has defined the two-year interval in addition to other intervals (i.e., 5, 10, 25, 50, etc.). Flood frequency data for stations at Forsyth, Missouri and at Flippin, Arkansas, for the White River and Tecumseh, Missouri, and Henderson, Arkansas, for the North Fork River, obtained from the individual state USGS offices for the general period 1921 to 1950, were plotted as a function of elevation and river mile upstream from the mouth of the White and North Fork rivers. The general floodplain limits for the White and North Fork river locations in the study area were determined from these two stations. By extrapolating between the two stream gages, the limits of the two-year floodplain were estimated for all locations. The lateral limits of the flood plain were estimated from the elevation of the two-year flood stage. In addition to flood frequency data, the maximum and minimum pool levels, and the topographic river profile were charted. The topographic river profile represents the point in the river's channel where the specified contour interval crosses the river. These profiles and their locations are shown in Figures 14 - 17.

Numerous topographic profiles were constructed for locations throughout the study area to determine the limits of the pre-inundation floodplain and to evaluate the impacts of reservoir flooding on both the fluvial and hill slope systems. A representative number of these topographic profiles constructed mainly in the river bendways are presented in Dunbar and Coulters (1989a; 1989b).

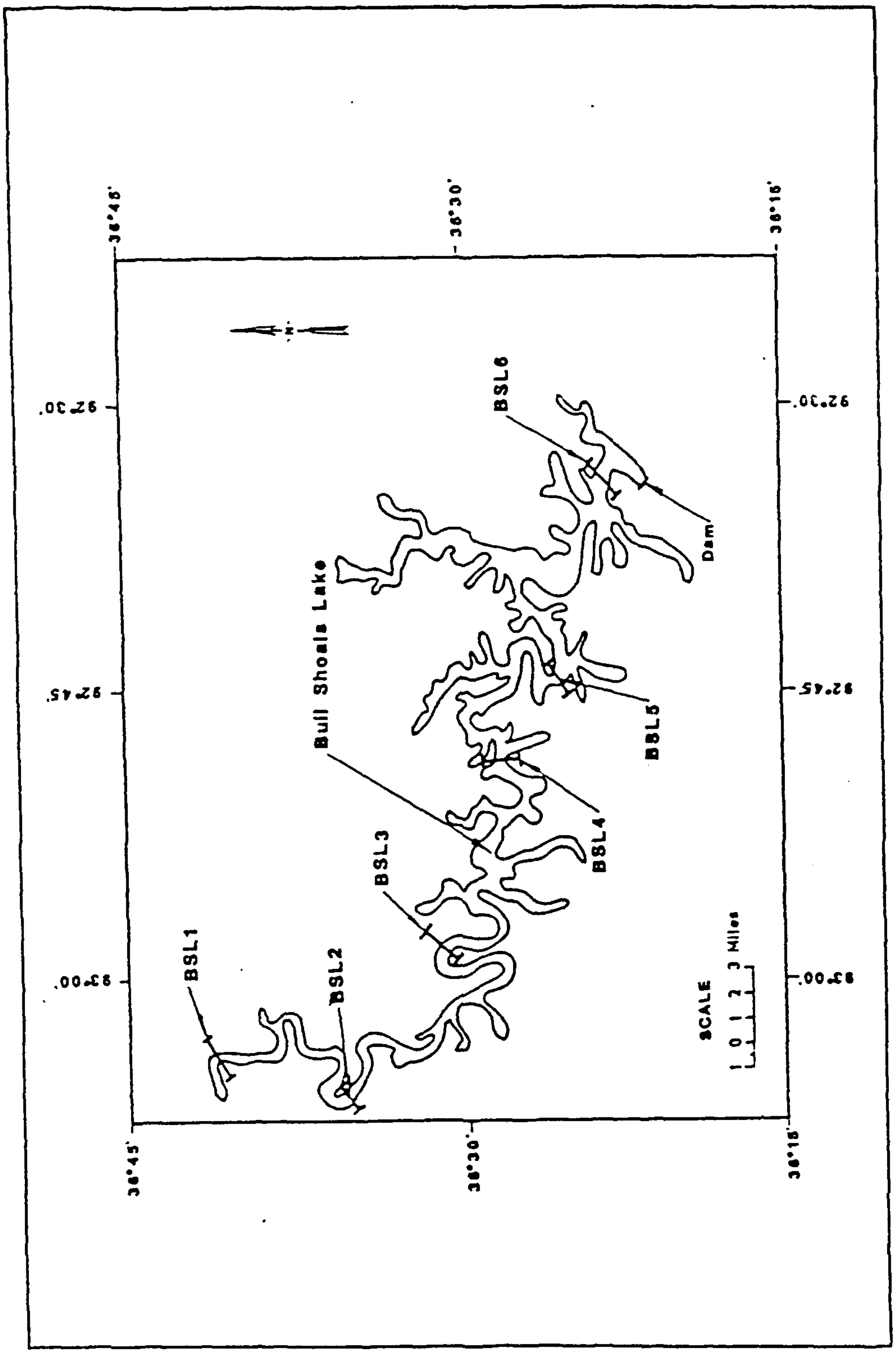


Figure 14. Index to Flood Frequency Profiles: Bull Shoals

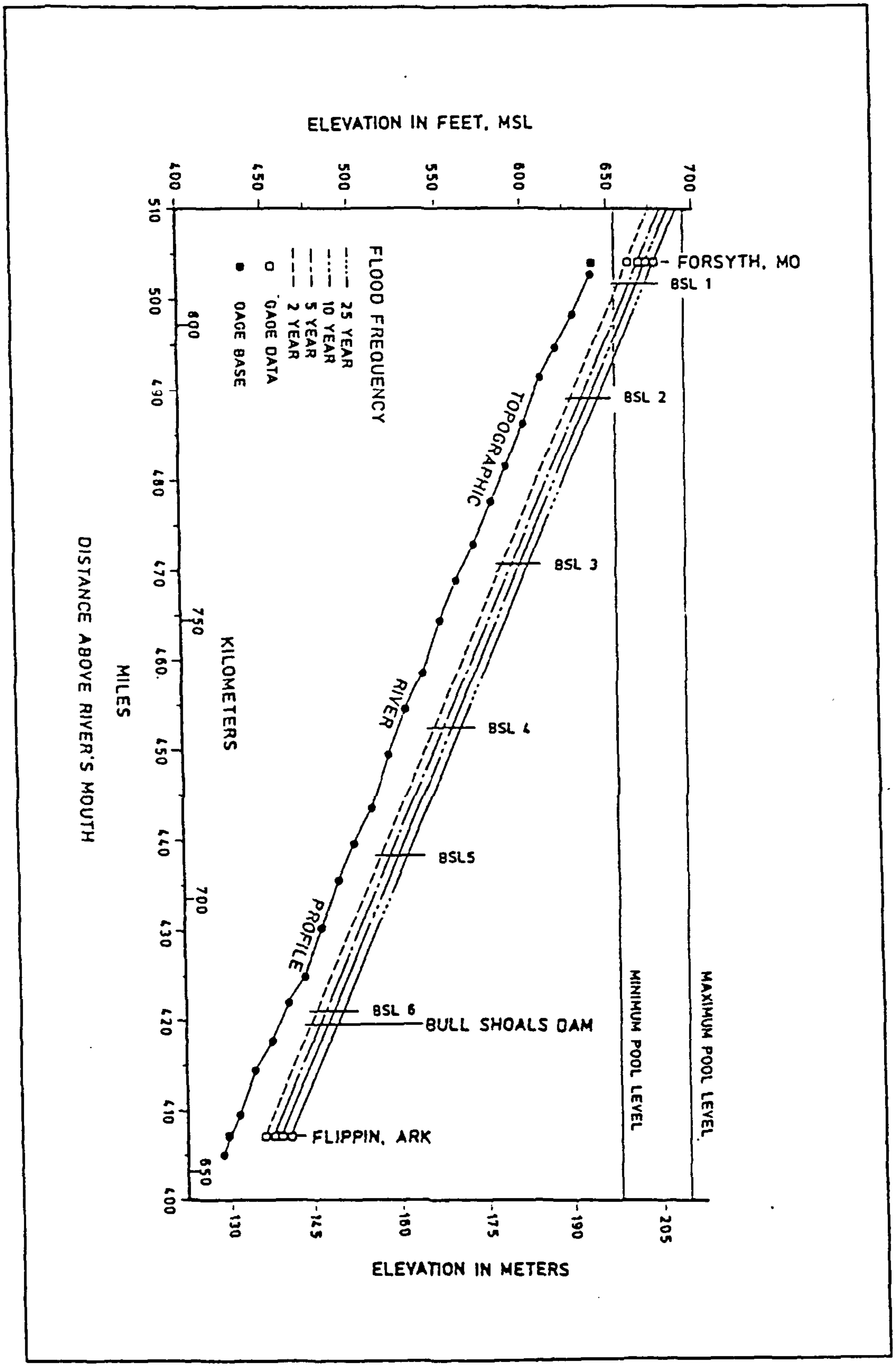


Figure 15. Pre-Impoundment Flood Frequency: Bull Shoals Lake

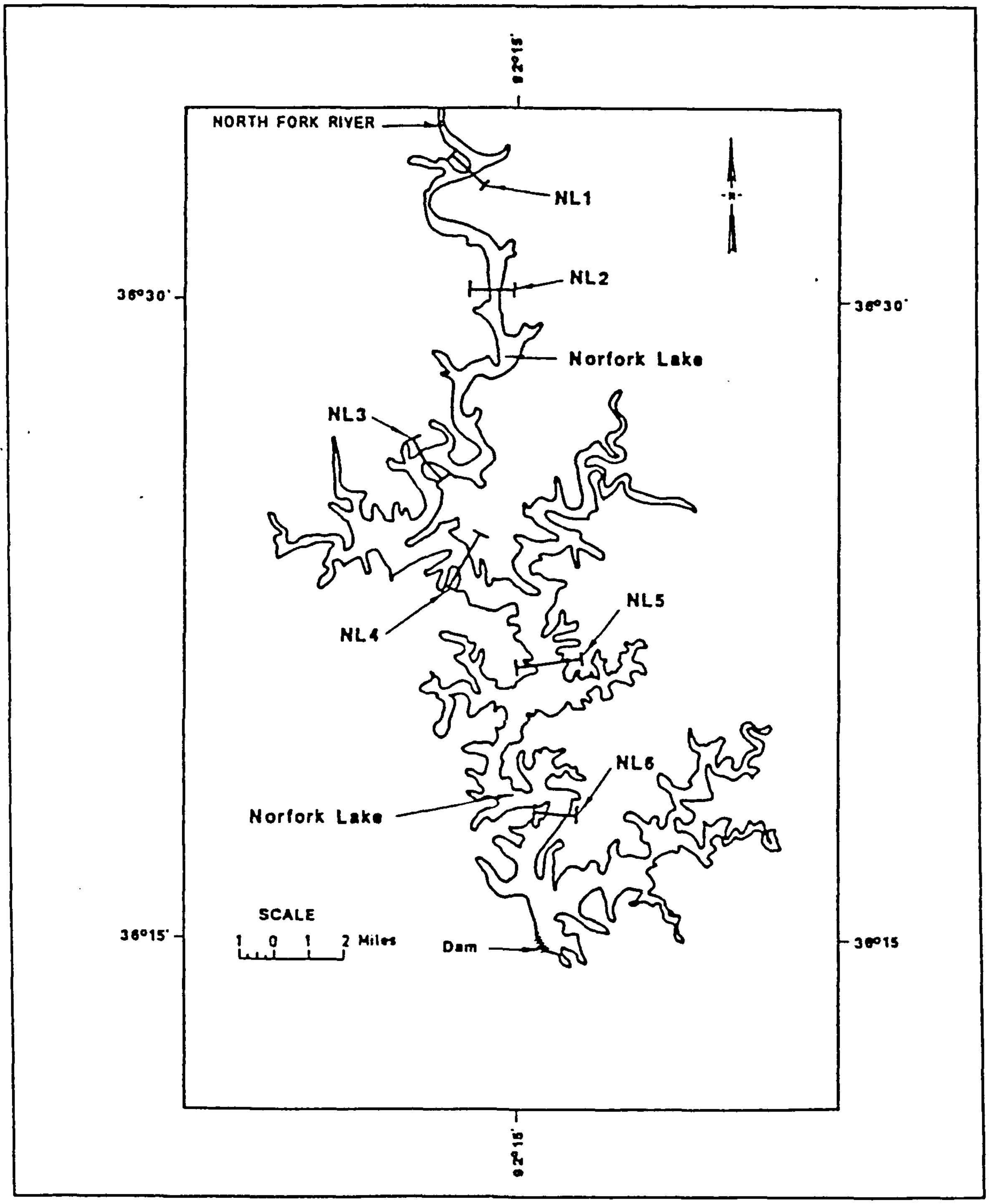


Figure 16. Index to Flood Frequency Profiles: Norfork Lake

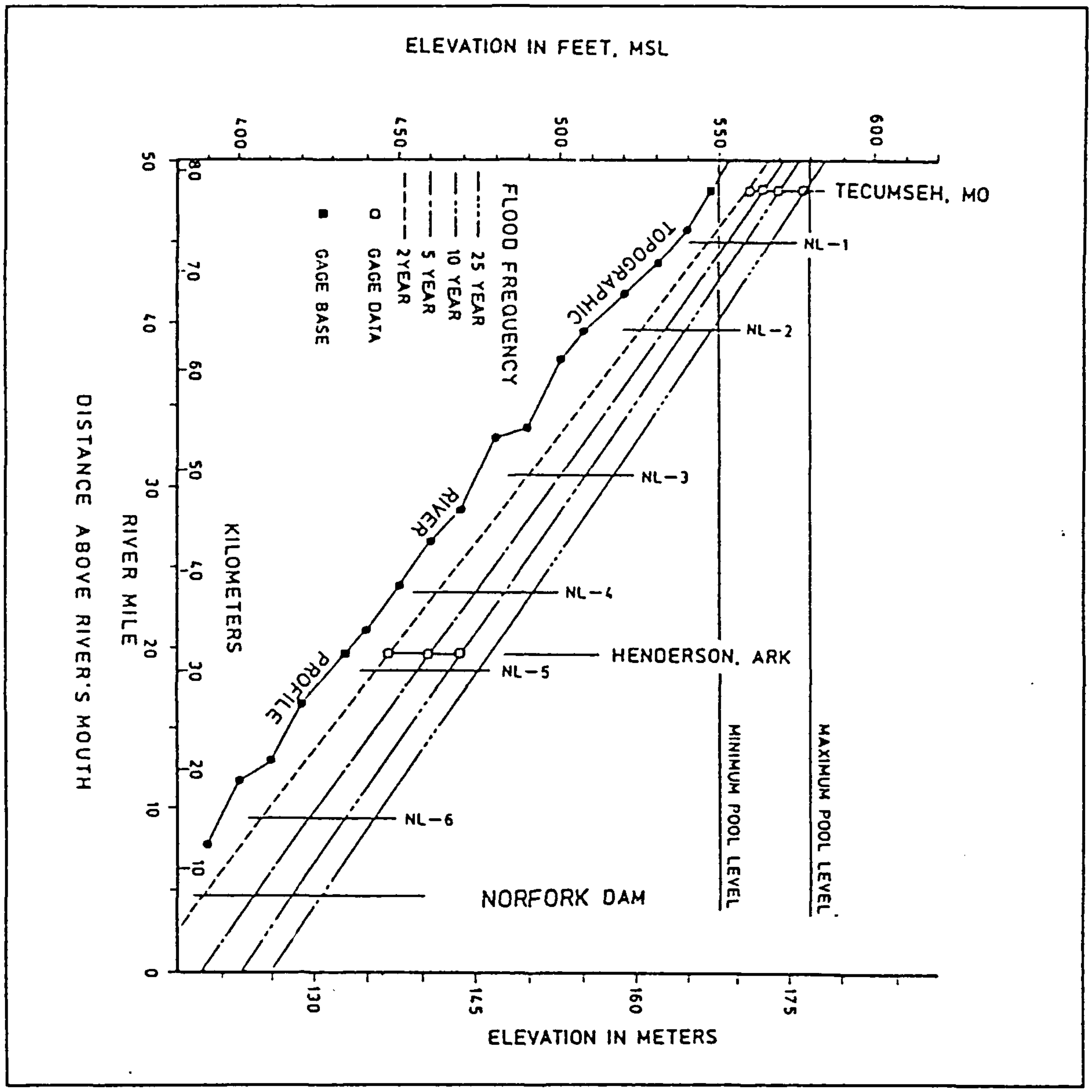


Figure 17. Pre-Impoundment Flood Frequency: Norfork Lake

Reservoir flooding has impacted the entire project area. At its minimum pool level Bull Shoals Reservoir has inundated the pre-impoundment flood plain to approximately river mile 500 (about the middle of the Forsyth Quadrangle). The maximum pool level has completely inundated the floodplain in the project area and a significant portion of the hillslope system. The maximum and minimum reservoir levels for each year since Bull Shoals Dam was constructed was calculated using data from the Bull Shoals Reservoir Resident Office. High water (elevation above 675 ft MSL) has occurred in 1957, 1961, 1973, 1979, 1982, 1983, 1984, and 1985.

At its minimum pool level Norfork Reservoir has inundated the pre-impoundment floodplain to approximately river mile 45 (about the top of the Udall Quadrangle). The maximum pool level has completely inundated the floodplain in the Norfork Reservoir and a significant portion of the hill slope system. The maximum and minimum reservoir levels for each year since Norfork Lake Dam was constructed was calculated using data from the Norfork Reservoir Resident Office. High water (elevation above 565 ft MSL) has occurred in 1945, 1957, 1961, 1973, 1979, and 1985.

Types of Floodplain Sediments and Major Processes. Within the limits of the floodplain area are sediments deposited by the main stream and its tributaries. Fluvial sediments are deposited by only two methods, either by vertical accretion or by lateral accretion.

Vertical accretion on the floodplain occurs during times of high water flow when the river's banks are crested and sediments are deposited on top of the river banks. Sediments deposited by vertical accretion become finer-grained with distance from the stream bank because the velocity of floodwater flow decreases with distance away from the channel. The velocity of channel flow determines the maximum sediment grain-size that is transported. Further away from the channel, silts and clays are deposited, while closer to the channel, the more coarse-grained sediments, such as fine sand, are deposited.

In contrast, lateral accretion occurs within the confines of the river channel. Lateral accretion, as the name implies, is the deposition of sediment in the form of bars in response to channel migration. Deposits formed by lateral accretion are usually coarse-grained, consisting of fine to coarse sand and/or fine gravel because they are deposited in relatively high velocity flows in the channel.

The floodplain sediments formed by the two basic processes described above can be further differentiated according to the different depositional environments in which these sediments are deposited. The different kinds of floodplain environments present in the project area will be described individually later in this report.

Fluvial Erosion and Valley Migration. In addition to deposition, erosion by fluvial scouring occurs along the outside bendways or cutbanks of the White and North Fork rivers. In much of the project area the cutbanks are formed of bedrock. Fluvial scouring along the cutbank of the channel and associated deposition on the inside or convex side of the channel, permits a river to migrate across its floodplain. Associated with the valley-wide lateral migration of the White River during geologic time has been fluvial downcutting by stream entrenchment. The net migration of the White River across its flood plain in both the horizontal and vertical dimensions has produced a characteristic valley width.

The valley width (width between summits) for the main channel is much different in the channel bendways as compared to the straight river reaches. Valley width is at a maximum in the bendways, almost double the width of the straight river reaches. The net result of both horizontal and vertical migration is best displayed in the channel bendways, where a faint "stair-step" character is sometimes displayed on the convex side of each river bendway. These eroded stair-steps represent terraces and mark past elevations of the river's floodplain.

Abandoned Floodplains - Terraces. A terrace is simply an abandoned floodplain surface that remains elevated above the present river's floodplain. Terraces are a transitional landform between the hill slope and the fluvial systems. Terraces will often display characteristics of and receive sediment from both systems. With the passage of time and an increased distance away from the floodplain, terraces may become so altered by hill slope geomorphic processes that the original fluvial characteristics of the flood plain are destroyed.

Bates and Jackson (1980) define a terrace as consisting of a relatively flat or gently inclined surface that is bounded on one edge by a steeper descending slope and on the other edge by a steeper ascending slope.

Furthermore, they state that the term terrace is commonly but incorrectly applied to the deposit underlying the surface. The term is used correctly in the context of topographic form rather than identifying the material underlying the terrace surface. Terraces are composed of either fluvial sediments (depositional type terraces) or parent material (rock) that was scoured clean of soil by the actions of the stream (erosional type terrace).

There are other important characteristics that distinguish terrace surfaces from the floodplain in addition to topography and flood frequency. The major characteristic that distinguishes a terrace from a flood plain in addition to flood frequency and topography is the development of a soil profile within the fluvially deposited sediments. The presence or absence of a soil profile reflects the types of geomorphic processes that are active in the area and also indirectly identifies the relative time that has transpired for the profile to develop. Soil forming processes and the development of a soil profile are controlled by the composition and physical properties of the underlying terrace surface, the environmental influences (climate and geomorphic processes) to the terrace surface, the topography and slope of the surface, the types of vegetation which are growing on the surface and the land use characteristics of that area (i.e., crop land versus timber, etc.), and the length of time involved in which the soil has developed. These characteristics control the different types of geomorphic and pedogenic processes that are involved in soil formation and they govern the soil profile development.

The field investigation conducted in the Bull Shoals project area included examination of soil profiles in cut banks and soil cores. The mapping of terraces on the geomorphic maps is based in part on the examination and interpretation of soil samples and soil profiles. The recognition and understanding of the different physical and chemical characteristics of terrace soils is important in differentiating multiple terrace levels and in interpreting the geomorphic chronology of the Quaternary in the study area.

CHAPTER 4. THE PRE-EURO-AMERICAN ARCHEOLOGICAL RECORD

Introduction

The pre-Euro-American archeological record is documented at 402 locations within the two project areas; 132 at Norfork Lake and 270 at Bull Shoals Lake (Only 143 of the pre-Euro-American sites at Bull Shoals Lake could be assigned to particular landforms. The remainder are inundated.) This record, as presently documented, consists overwhelmingly of scatters of lithic debris. In fact, lithic debris is present at all of these locations. Other types of artifactual debris, i. e., ceramics, are only reported at 17 locations in Bull Shoals Lake (12 of these are presently inundated) and at only one location in Norfork Lake.

The built environment created by the pre-Euro-American occupants of the project areas has been documented at only a very few locations. Humanly constructed mounds are reported for only one location. Human burials are reported at 13 locations in Bull Shoals Lake (all positively correlated with the presence of ceramics) and one at Norfork Lake. None of these occur on Summits or Backslopes.

Given the nature of the pre-Euro-American archeological record as it is presently documented, it seems appropriate to consider its distribution across the landscape in terms of the clusters of lithic debris which comprise 99+% of this record. In the following pages we consider the distribution of this scatter of material in two ways. This chapter presents data illustrating the distribution of those clusters of materials we have called sites. This is done separately for Bull Shoals and Norfork lakes. A comparison of the site distribution at these lakes across the various elements of the landscape such as was done in the shoreline surveys can be made by comparing the percentage of the area in a particular landscape with the percentage of total sites recorded for that landform. The percentage of the area composed by a particular landform is derived by dividing the acreage for each landform by the total mapped acreage. In this calculation the portions of the project areas presently inundated are not considered.

This sort of comparison, formerly quite popular among researchers, does not provide an accurate representation of their distribution since, while we know the percentage of each project area composed by the various landforms, we do not know how much of each landform has been examined. It is possible for the site distribution to be largely, perhaps entirely, a function of the survey methods.

In order to overcome this problem, we have created another data set which matches the sites recorded and the acreage of the various landforms examined during our intensive survey of 7,489 acres at Norfork Lake. If researchers want to think in terms of sites, this data set will give a much more accurate depiction of the distribution of sites across the landscape. Of course even a data set such as this can never be completely accurate since, fairly often, a scatter of artifacts (a site) covers all or portions of adjacent landforms. Further, there is the problem of site definition. When we match site occurrence against landform acreage all sites are considered equal. The single flake discovered in the eroded roadbed and the 20 acre mound complex have the same weight in such calculations.

In response to this problem we have attempted to model the distribution of some particular elements of the lithic debris found scattered across the landscape. The particular elements considered are flakes, bifaces, dart points, and object pieces -a category of material which includes flaked cobbles, flaked pebbles, flaked chunks, and tested cobbles. These elements were chosen because they occur in most of the collections made during the intensive survey and because these types of artifacts have traditionally attracted the interest of archeologists. There were 88 collections of pre-Euro-American materials made during the intensive survey. Each of these was recorded as a separate site. Of these, 78 collections included flakes (N = 794), 54 collections included bifaces or biface fragments (N = 159), 27 collections included dart points or fragments (N = 58), and 29 collections included object pieces (N = 58).

The choice of these four elements is, admittedly, arbitrary. Other researchers may wish to choose different elements, to look at smaller subsets such as quartzite flakes or the like, or to group different elements into different sets. As the system is presently configured such manipulations are very easy. The data base constructed for this effort was, after all, constructed as a management tool.

Finally, true to the orientation adopted for this effort, we treat the distribution of this archeological record as an attribute of the landscape. The goal here is to talk about the nature of the archeological record as it presently exists on particular portions of the landscape. Thus the following presentation is organized on the basis of five basic landforms identified in the project area; Summits, Sideslopes, Footslopes, Terraces, and Floodplains. To do this it has been necessary to group the various subdivisions of these landforms back into their larger units. For example, we have grouped together the landforms identified as terrace undifferentiated, high terrace, intermediate terrace, and low terrace into the landform category of Terrace. The tracking of site or artifact distribution could just have easily been done for the various subdivisions. Space, however, precludes a presentation in this format of all the manipulations one could make.

It has also been necessary for us to assign scatters which are distributed over more than one landform to a single landform. We have used the following guidelines to do this. Materials scattered across both Summits and Sideslopes are grouped together under Summits. Continuous scatters across Terraces and portions of Sideslopes were grouped under Terrace.

In assessing the distributional patterns which emerge from these various manipulations it is important to remember that the landform analysis upon which they are based was undertaken at a reconnaissance level. It is based primarily upon the analysis of aerial photographs and topographic maps with very limited field observation. While we are confident that this provides an accurate estimate of the way in which the identified landforms are distributed, we recognize that further field observations would undoubtedly alter slightly the boundaries between many of these landforms. Moreover, it is quite possible that further field observations would alter the identification of particular landforms in a small number of cases. In other words, the analysis of the landscape presented in this study should not be considered to be either complete or perfect.

With these caveats in mind, let us now turn to a consideration of the data generated thus far concerning the distribution of the archeological record at Bull Shoals and Norfork lakes.

Each section begins with a general description of the landform. This is followed by a statement of the percentage of the area this landform occupies within the two lakes and the number of sites recorded for this landform at the two lakes. The last portion of each section lists the acreage of this landform examined during the intensive survey of Norfork Lake, the number of sites recorded for the landform and a description of the distribution of flakes, bifaces, dart points, and object pieces across the landscape.

Hillslope Geomorphic Systems

Summits. The study boundaries were based on the Summit locations and Summits are identified for all the quadrangle maps. The main criteria for defining a Summit was slope angle and position relative to the pre-impoundment and reservoir floodplain. (Within this system summits may also occur at intermediate levels on the hill slope. Intermediate level summits [benches] are formed by differential erosion of rock of varying resistance or by a change of base level erosion. Such landforms were, however, not mapped during this project.)

Summits are level to gently sloping hill crests characterized by convex slopes. The major processes operating on the convex summits are soil creep and the formation of soil from the decomposition of the underlying bedrock. Associated with these processes are bioturbation and general erosion by sheet wash, rill formation, and gully formation. In general, summits in the project area are tree covered and they are composed of thin, very cherty silt loam soils (Ward and McCright 1983; and Harper, Fowlkes, and Howard 1981). Bedrock is often exposed or is present on the surface as angular to subangular gravel and cobbles.

A total of 25,286 acres (15.1%) were mapped as Summits in Bull Shoals Lake and 10,975 (14.5%) acres were mapped as Summits in Norfork Lake. Only 5 (3.5%) sites are located on Summits in Bull Shoals Lake. Fourteen (10.6%) sites are recorded on Summits in Norfork Lake.

Summits were present within 13 of the 17 Survey Units. Of the area examined, 458 acres (6.1%) were classified as Summit. Nine sites (10.2%) were recorded on areas mapped as Summits. The scatters of materials were almost entirely restricted to the upper 10cm of the landform. Only in one instance were materials recovered below 20cm.

**Table 4. Flakes Recovered from Summits
(64 items in 8 collections)**

Items per Collection	Number of Collections
1	1
2-5	2
6-10	1
>10	2

**Table 5. Bifaces Recovered from Summits
(16 items in 5 collections)**

Items per Collection	Number of Collections
1	2
2-5	2
6-10	
>10	1

**Table 6. Dart Points Recovered from Summits
(9 items in 3 collections)**

Items per Collection	Number of Collections
1	2
2-5	
6-10	1
>10	

**Table 7. Object Pieces Recovered from Summits
(5 items in 4 collections)**

Items per Collection	Number of Collections
1	3
2-5	1
6-10	
>10	2

Sideslopes. Sideslopes are the gently to steeply sloping portions of hillslopes. The major geomorphic process occurring on Sideslopes is sediment transport, mainly by surface erosion and by mass movements. Slope angle is critical to the kinds of processes that are operating on Sideslopes and to the types of slopes that will be developed. Rock slopes begin to develop at some critical or threshold angle and the type of mass movement changes from soil to rock dominated movements. The exact critical angle for the beginning of rock faces is unknown. The minimum angle is interpreted to be about 45 degrees (100 % slope) for the project area. Woody vegetation occurs on both soil and rock Sideslopes. Other types of geomorphic processes occur on Sideslopes in addition to sediment transport. These processes are usually minor in comparison and include soil formation, bioturbation, and surface erosion.

Sideslopes were differentiated into soil and rock slopes and primarily rock slopes or faces. An important aspect of rock faces in cultural resource surveys is the possible presence of rock shelters or caves.

A total of 124,766 acres (74.3%) were mapped as Sideslopes in Bull Shoals Lake and 53,381 acres (70.8%) were mapped as Sideslopes in Norfork Lake. Fifty five (38.5%) sites are recorded on Sideslopes in Bull Shoals. Forty five (34.1%) sites are recorded on Sideslopes in Norfork Lake.

Sideslopes were encountered in every Survey Unit. Of the area examined, 4,541 acres (60.9%) were classified as Sideslopes. Twenty nine sites (32.9%) were recorded for areas mapped as Sideslopes. Of these 29 sites materials were gathered from deeper than 20cm below the surface at only five locations; one of which was greater than 40cm below the surface.

Table 8. Flakes Recovered from Sideslopes (305 items in 26 collections)

Items per Collection	Number of Collections
1	
2-5	15
6-10	5
>10	6

Table 9. Bifaces Recovered from Sideslopes (35 items in 17 collections)

Items per Collection	Number of Collections
1	12
2-5	3
6-10	2
>10	

Table 10. Dart Points Recovered from Sideslopes (8 items in 5 collections)

Items per Collection	Number of Collections
1	2
2-5	3
6-10	
>10	

Table 11. Object Pieces Recovered from Sideslopes (22 items in 9 collections)

Items per Collection	Number of Collections
1	5
2-5	3
6-10	1
>10	

Footslopes. Footslopes occur at the base of hillslopes. The major geomorphic process occurring on footslopes is sediment accumulation. Sediment from surface wash and mass movements are deposited at the base of hillslopes. Because of sediment deposition, footslopes are concave in profile. Other geomorphic processes that occur on foot slopes include soil formation, bioturbation, erosion by sheet wash and mass movements, and occasional fluvial scouring and vertical accretion of fluvial sediment during high water periods when flood flow covers the lower foot slopes.

Footslopes were differentiated into two general types. The first category is primary Footslope. Primary Footslopes are those associated with a permanent stream channel and a floodplain. Primary Footslopes are adjacent to the major tributaries and to the White River. Primary Footslopes are the least mapped feature of the three components of the hillslope classification. In most of the project area primary Footslopes are underwater. In the headwaters where primary Footslopes are exposed, either the mapping scale (1:24,000 scale and 20 ft contour interval) is too small to differentiate this landform clearly or the energy of the White River fluvial system has removed the sediment and debris from the base of slopes at a rate where large-scale accumulation of materials was prevented. The lack of primary Footslopes in the project area is interpreted to be from a combination of these two reasons. Primary foot slopes in the project area occur mainly in the bendways of the White River. This suggests that lateral migration of the stream channel away from the base of a hill slope allows sediment to accumulate because of the decrease in fluvial flooding and scouring (less energy for sediment removal).

The second category of Footslope is secondary Footslope. Secondary Footslopes are associated with intermittent stream channels which lack a true floodplain. Secondary Footslopes occur at a much smaller scale than primary Footslopes and they reflect both fluvial and hillslope processes and sediments. Secondary Footslopes occur throughout the project area.

Alluvial fans which form at the base of hillslopes are often associated with hillslope systems. Alluvial fans are stream-deposited cone-shaped masses of fluvial sediment formed at the base of steep upland slopes. Because of the mapping scale or because the energy of the White River fluvial system is able to remove the basal debris, no alluvial fans were identified in the project areas.

A total of 5,612 acres (3.3%) were mapped as Footslopes in Bull Shoals Lake and 4,305 acres (5.7%) were mapped as Footslopes in Norfork Lake. Thirty two (22.4%) sites were recorded on Footslopes on Bull Shoals Lake. Seventeen (12.9%) sites are recorded on landforms mapped as Footslopes in Norfork Lake.

Footslopes were mapped within all but one of the Survey Units. Of the area examined, 431 acres (5.8%) were classified as Footslope. Eleven sites (12.5%) were recorded on areas mapped as Footslopes. Materials were recovered from deeper than 20cm below the surface in only one instance.

Table 12. Flakes Recovered from Footslopes
(50 items in 10 collections)

Items per Collection	Number of Collections
1	3
2-5	5
6-10	
>10	2

Table 13. Bifaces Recovered from Footslopes
(15 items in 6 collections)

Items per Collection	Number of Collections
1	3
2-5	2
6-10	1
>10	

Table 14. Dart Points Recovered from Footslopes
(5 items in 3 collections)

Items per Collection	Number of Collections
1	1
2-5	2
6-10	
>10	

Table 15. Object Pieces Recovered from Footslopes
(10 items in 5 collections)

Items per Collection	Number of Collections
1	3
2-5	2
6-10	
>10	

Closely related to the Footslope landform are several locations where footslopes and terraces interfaced. These were classified as Footslope/Terrace (F/T). There were a total of 148 acres (2.0%) in this classification and five sites (5.7%) were recorded for landforms designated in this way. At three of these locations materials were recovered from deeper than 20cm below the surface.

Table 16. Flakes Recovered from Footslope/Terrace Interfaces (23 items in 3 collections)

Items per Collection	Number of Collections
1	
2-5	1
6-10	2
>10	

Table 17. Bifaces Recovered from Footslope/Terrace Interfaces (4 items in 3 collections)

Items per Collection	Number of Collections
1	2
2-5	1
6-10	
>10	

Table 18. Dart Points Recovered from Footslope/Terrace Interfaces (3 items in 2 collections)

Items per Collection	Number of Collections
1	1
2-5	1
6-10	
>10	

Table 19. Object Pieces Recovered from Footslope/Terrace Interfaces (3 items in 2 collections)

Items per Collection	Number of Collections
1	1
2-5	1
6-10	
>10	

Fluvial Geomorphic Systems

Terraces. The terraces mapped on the geomorphic maps are flat or gently inclined surfaces which occur between the hill slopes and the flood plain. The boundary between the terrace and the floodplain was first identified by defining the limits of the floodplain. This boundary was further refined by incorporating various different types of data into the location estimate. These data included topographic information, soils data from the available county soil survey bulletins, and present land-use interpreted from aerial photography and by field observation. The terraces mapped on the geomorphic maps are primarily depositional type terraces (i.e., composed of alluvium).

Most of the terrace landform was mapped as undifferentiated Quaternary terrace. In the head waters of the study area, multiple terrace levels were identified and they were differentiated as low, intermediate, and high terrace levels, respectively. The classification of terraces as low, inter- mediate, or high implies only topographic position, it does not imply similar age for equivalent levels that are situated on adjacent meanders. A more detailed evaluation of terrace sediments (i.e., primarily definition of soils data) would be necessary to differentiate terrace ages and correlate the different surfaces laterally. Each terrace must be evaluated separately before specific details can be interpreted for the Holocene and Pleistocene chronology of the White and North Fork rivers.

The different terraces are formed from alluvial sediments which have had sufficient time to develop a soil profile. The soils data identifies buried soil horizons. The presence of buried horizons suggests a fluvial system that has aggraded and subsequently degraded its flood plain several times while the system was operating at that elevation. Alternatively, each different soil horizon may represent a single major flood event (period) while the river was flowing at that level.

As part of the field reconnaissance at Norfork Lake, limited soil sampling was conducted on selected terrace surfaces. In addition, nine shallow cores were extracted by Archaeological Assessments Inc. in early June, prior to the WES field reconnaissance, on a multiple terrace at Ford Cove (Udall Quadrangle) on Norfork Lake. Borings were drilled on each terrace level that was mapped. The terrace levels were determined by topographic position in the field, from the use of 1:10,000 scale topographic maps, and boring data. Figure 18 illustrates the location of four of these cores, a general topographic cross-section at Ford Cove, and a graphic representation of the soil profiles noted for the four cores. The profiles for these cores were described by James Hoelscher.

Ford Cove Core 1

Depth (cm)	Description
0-19	Ap. Brown (10YR 5/3) very fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium granular and weak medium subangular blocky structure; friable; clear smooth boundary
19-55	B. Yellowish brown (10YR 5/4) heavy, very fine sandy loam; pressure flake at 20cm; moderate medium subangular blocky structure; friable; clear smooth boundary
55-103	2A2. Yellowish red (5YR 6/3) very fine sandy loam; weak medium subangular blocky structure; friable; abrupt smooth boundary
103-130	2B21t. Red (2.5YR 4/8) sandy clay loam; common medium distinct pale brown (10YR 6/3) mottles; few FeMn concretions; common thick clay films on ped faces; strong medium subangular blocky structure

Ford Cove Core 2 (Comments: Chert by volume 15-20% throughout profile; colluvium)

Depth (cm)	Description
0-15	Ap. Brown (10YR 5/3) silt loam; common fine distinct gray (10YR 6/1) mottles; moderate medium granular structureless; friable; clear smooth boundary
15-56	B. Yellowish brown (10YR 5/4) heavy silt loam; moderate medium subangular blocky structure; friable; abrupt smooth boundary
56-121	2Bt. Yellowish brown (10YR 5/8) silty clay loam

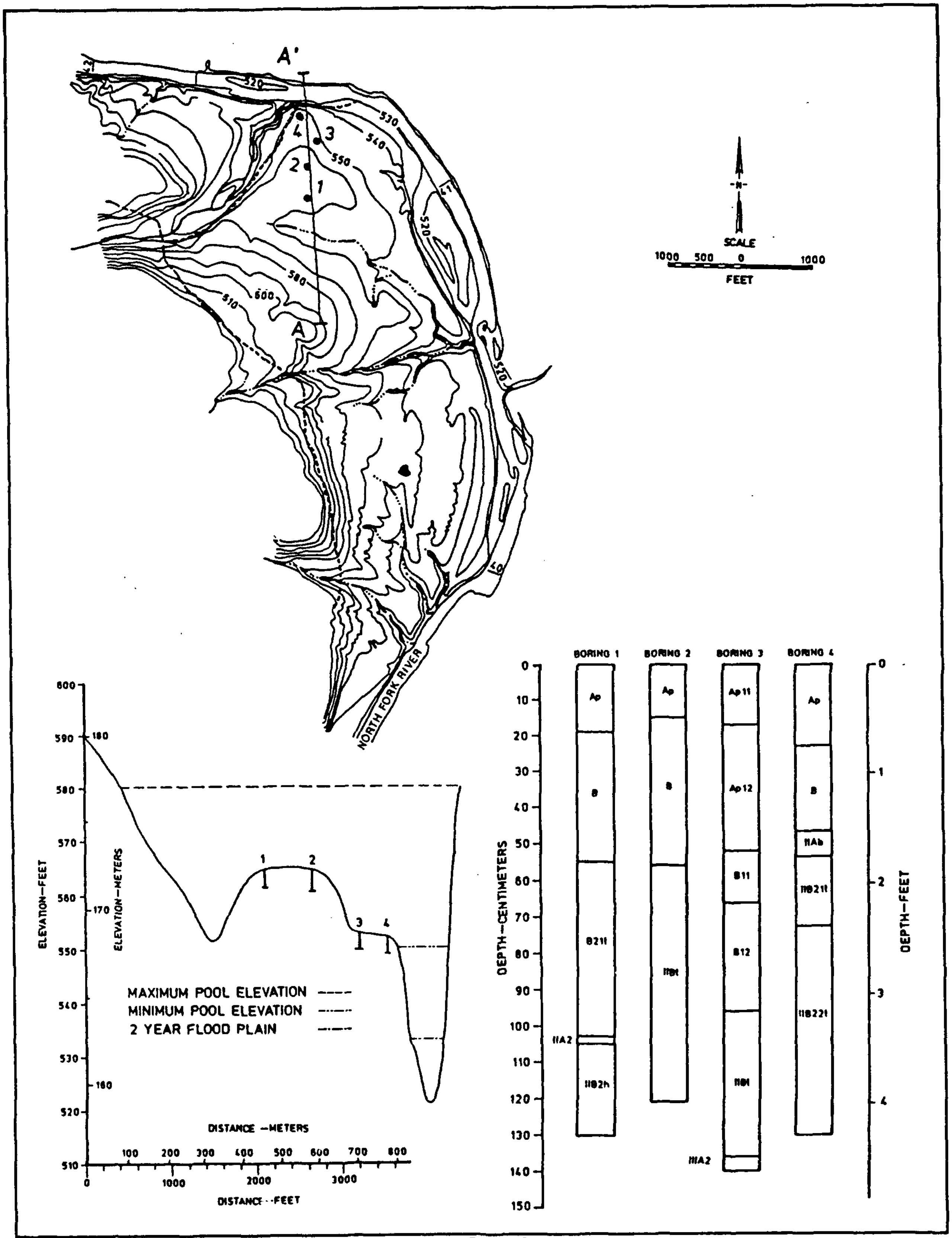


Figure 18. Ford Cove Soil Core Data

Ford Cove Core 3

Depth (cm)	Description
0-17	Ap11. Dark grayish brown (10YR 4/2) fine sandy loam; few fine distinct light brownish gray (10YR 6/2) mottles; moderate medium granular structureless; very friable; clear smooth boundary
17-52	Ap12. Very dark grayish brown (10YR 3/2) very fine sandy loam; anthropically enriched; moderate medium granular and weak medium subangular blocky structure; very friable; clear smooth boundary
52-66	B11. Brown (10YR 5/3) heavy silt loam; weak medium subangular blocky structure; friable; gradual smooth boundary
66-96	B12. Yellowish brown (10YR 5/4) heavy silt loam; few fine faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; abrupt smooth boundary
96-136	2Bt. Yellowish brown (10YR 5/8) sandy clay loam; common distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; clay films on ped faces; common FeMn concretions; moderate medium subangular blocky structure; firm; abrupt smooth boundary
136-140	3A2. Pale brown (10YR 6/3) silt loam; weak fine granular and possibly weak medium subangular blocky structure

Ford Cove Core 4

Depth (cm)	Description
0-23	Ap. Brown (10YR 5/3) very fine sandy loam; common FeMn concreations; common light bownish gray (10YR 602) mottles; moderate medium granular and weak medium subangular blocky structure; very friable; clear smooth boundary
23-47	B. Yellowish brown (10YR 5/4) and dark grayish brown (10YR 4/2) loam; common light brownish gray (10YR 6/2) mottles; few FeMn concretions; friable; clear smooth boundary
47-52	2Ab. Yellowish brown (10YR 5/4) and dark grayish brown (10YR 4/2) fine sandy loam
52-73	2B21t. Yellowish brown (10YR 5/6) silty clay loam; strong medium subangular blocky structure; clear smooth boundary
73-130	2B22t. Light brownish gray (10YR 6/2), pale brown (10YR 6/3) and red (2.5YR 4/6) sandy clay loam; common FeMn concretions; common clay films on ped faces; strong medium subangular blocky structure

The soil profiles at Ford Cove become more mature with distance upslope from the river. This indicates that the terrace surfaces, located on the convex side of a river meander, generally become older with an increase in elevation and distance from the main channel. It is judged that the lower terrace surface represents a Holocene and/or Pleistocene age surface, while the intermediate and upper level terraces at this location may possibly represent Late or perhaps Middle Pleistocene age surfaces.

Soil coring at selected terrace locations was also part of the geomorphic investigations at Bull Shoals Lake. Three cores were extracted on a multiple terrace structure at Mays Bend (Mincy Quadrangle); one for each terrace level that was mapped. These terrace levels were determined by topographic position in the field.

Figure 19 depicts the location of these cores, a cross-section profile of the structure, and a graphic representation of the soil profiles. The profiles for these cores were described by James Hoelscher.

Mays Bend Core 1

Depth (cm)	Description
0-10	A. Dark brown (10YR 3/3) very fine sandy loam; moderate medium granular structure; very friable; pH 7.0; clear smooth boundary
10-38	A&B. Dark yellowish brown (10YR 3/4) very fine sandy loam; weak medium subangular blocky structure; very friable; pH 6.5; abrupt smooth boundary
38-73	Bw. Dark yellowish brown (10YR 4/6) heavy very fine sandy loam; moderate medium subangular blocky structure; friable; pH 6.5; abrupt smooth boundary
73-77	2A'. Dark yellowish brown (10YR 3/4) very fine sandy loam; weak medium granular and weak medium subangular blocky structure; very friable; pH 6.5; clear smooth boundary
77-116	2Bw1. Dark brown (7.5YR 4/4) sandy clay loam; few fine faint pale brown mottles; moderate medium subangular blocky structure; friable; pH 6.0; clear smooth boundary
114-146	2Bw2. Dark brown (7.5YR 4/4) sandy clay loam; common fine distinct pale brown mottles; moderate medium subangular blocky structure; friable to firm; few FeMn concreations; pH 67.0; abrupt smooth boundary
146-156	3A'&B. Mottle dark yellowish brown (10YR 3/4) and dark brown (7.5YR 4/4) silt loam to heavy silt loam; weak medium subangular blocky structure; friable; pH 6.0; clear smooth boundary
156-233	3Bt. Dark brown (7.5 4/4) silty clay loam; few yellowish brown (10YR 5/4) pockets of fine sandy loam; moderate medium subangular blocky structure; firm; pH 6.0

Mays Bend Core 2

Depth (cm)	Description
0-14	A. Dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; very friable; pH 6.0; clear smooth boundary
14-24	A&B. Brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; pH 5.5; clear smooth boundary
24-63	Bt. Yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; pH 5.0; clear smooth boundary
63-74	2A&B. Pale brown (10YR 6/3) heavy silt loam; common medium distinct eyllowish brown (10YR 5/6) mottles; few FeMn concretions; moderate medium granular and moderate medium subangular blocky structure; friable; pH 5.0; clear smooth boundary
74-95	2Bt. Mottled yellowish red (5YR 5/6), yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) heavy silty clay loam; few FeMn concretions; strong medium angular and subangular blocky structure; firm; pH 4.5

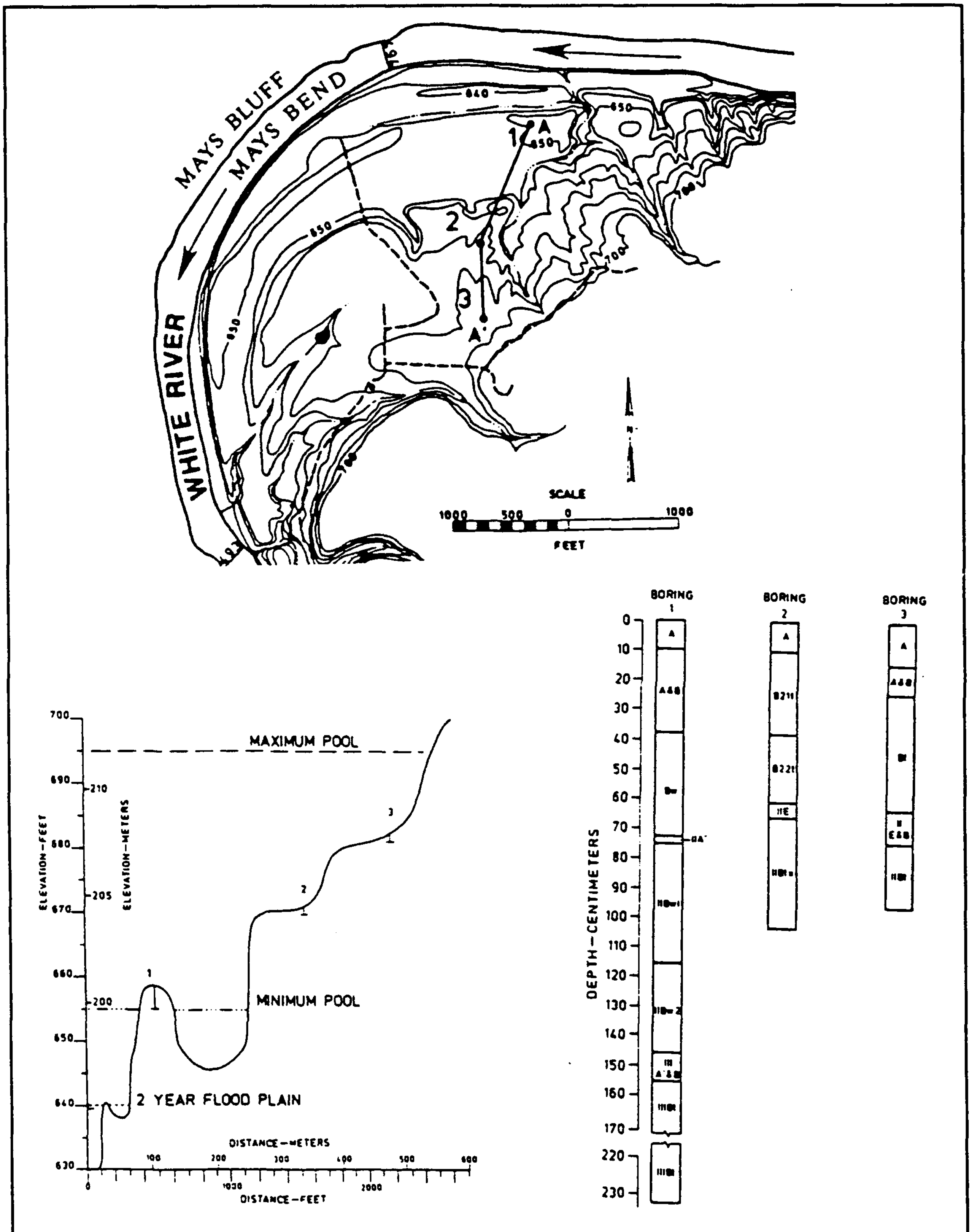


Figure 19. Mays Bend Soil Core Data

Mays Bend Core 3

Depth (cm)	Description
0-10	A. Dark grayish brown (10YR 4/2) very fine sandy loam; moderate medium granular structure; very friable; pH 6.0; clear smooth boundary
10-38	B21t. Dark yellowish brown (10YR 4/6) silty clay loam; common fine distinct light brownish gray mottles; moderate medium subangular blocky structure; friable; pH 5.0; gradual boundary
38-61	B22t. Dark yellowish brown (10YR 4/6) silty clay loam; common fine distinct light brownish gray motles; moderate medium subangular blocky structure; few FeMn concretions; friable; pH 5.0; gradual boundary
61-66	2E. Light brownish gray (10YR 6/2) silt loam; common medium distinct pale brown (10YR 6/3) mottles; particles from the B22t horizon introduced into this horizon; weak medium granular structure; friable; pH 5.0; clear smooth boundary
66-104	2Btx. Mottle strong brown (7.5YR 5/8) light brownish gray (10YR 6/2) and dark brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; firm brittle; common FeMn concretions; pH 5.0

As at Ford Cove the soil profiles at Mays Bend become more mature with distance upslope from the river. This indicates that the terrace surfaces, located on the convex side of a river meander, generally become older with an increase in elevation and distance from the main channel. It is judged that the lower terrace surface represents a Holocene and/or Pleistocene age surface, while the intermediate and upper level terraces at this location may possibly represent Late or, perhaps, Middle Pleistocene age surfaces. The higher level terrace on Mays Bend merges with the footslopes and has been mapped as having a dual classification of footslope and terrace as noted above.

Some terraces may have been classified in the geomorphic mapping as being part of the hillslope system. These terraces have downcut into the Ordovician age rocks and are primarily erosional or strath type terraces. This type of terrace occurs as a bench or intermediate level summit and is identified only from field inspections to determine for the presence of alluvial sediments. Usually the fluvial sediments remaining on these terrace remnants are coarse grained, consisting of rounded stream gravels and cobbles. The fine-grained sediments have long been eroded or washed away during the time that has passed since abandonment of these surfaces by the fluvial system. It is estimated that these types of "terraces" were probably abandoned several million years ago. This type of feature is mapped and presently occurs as an intermediate and high level summit. This type of terrace is well above the limits of the pre-impoundment floodplain.

A total of 3,414 acres (2.0%) acres were mapped as terraces in Bull Shoals Lake (2,310 were undifferentiated, 652 were low terrace, 390 were intermediate terrace, and 62 was high terrace) and 1,953 acres (2.6%) were mapped as terraces in Norfork Lake (1,391 acres as undifferentiated, 154 acres of low terrace, 389 as intermediate terrace, and 19 acres as high terrace).

Forty three (30.1%) sites are located on landforms mapped as terraces at Bull Shoals Lake. Forty two (31.8%) sites are located on landforms mapped as terraces at Norfork Lake.

Terraces were encountered in all but three of the Survey Units. Of the area examined, 1,493 acres (19.9%) were classified as Terrace. Thirty two sites (36.3%) were recorded on areas mapped as Terrace. At 18 of these locations materials were recovered from deeper than 20cm below the surface; seven of these were deeper than 30cm below the surface.

As indicated above, these terraces are constructed from multiple fluvial events. Because many of these events have taken place since humans began to create an archeological record in the area. Consequently the landscape within which this archeological record was created has been buried; along with the materials and portions of the built environment which were a part of it. Cutbank exposures and soil coring in the project area revealed a number of locations along several Terraces at which portions of the archeological record is currently buried. In some instances, the deposition of sediment covering the archeological record is likely to be a very recent occurrence; perhaps within the last several decades. At other locations, however, this burial may have taken place many hundreds or even thousands years ago.

Table 20. Flakes Recovered from Terraces (346 items in 29 collections)

Items per Collection	Number of Collections
1	1
2-5	12
6-10	4
>10	10

Table 21. Bifaces Recovered from Terraces (85 items in 22 collections)

Items per Collection	Number of Collections
1	7
2-5	10
6-10	3
>10	2

Table 22. Dart Points Recovered from Terraces (32 items in 13 collections)

Items per Collection	Number of Collections
1	6
2-5	6
6-10	2
10	

Table 23. Object Pieces Recovered from Terraces (20 items in 12 collections)

Items per Collection	Number of Collections
1	7
2-5	5
6-10	
>10	

Floodplain. Undifferentiated floodplain deposits were the major floodplain deposits identified for the project areas while areas where lateral accretion is dominant were mapped as point bar and marginal bar deposits and vertical accretion deposits were mapped as swamp.

The major depositional environment forming lateral accretion deposits is a point bar. Point bars are formed as a river channel migrates across its flood plain, depositing a sand bar along the inside or convex bank of the channel. With time, the convex sand bar grows in size and the point bar is developed. Associated with the point bar landform are a series of arcuate ridges and swales. The ridges are formed by lateral channel movement and represent relict sandy lateral bars separated by low lying swales. The swales are locations where fine grained sediments accumulate. Marginal bars form by the same process of lateral accretion, except they tend to develop in straight river reaches. Collectively these two types of sandy deposits form the point bar and marginal bar environment. The principal geomorphic process in this environment is lateral accretion. Other processes that are active include minor vertical accretion, fluvial scouring, bioturbation, and sheet wash erosion. The point bar deposit is the dominant and the most dynamic environment within the flood plain. Point bar limits were defined primarily from interpretation of the aerial photography and topographic information.

Point bar and marginal bar deposits are as thick as the total depth of the river that formed them. These deposits fine up-ward from the maximum size of the river's bedload (coarse sand and/or fine gravel) to fine-grained soils (usually silt or clay) at the surface. The basal or coarse grained portion of the point bar sequence is deposited by lateral accretion while the upper most or fine-grained portion of the point bar sequence is deposited by over-bank deposition or vertical accretion.

A complete fining-upward sequence was observed in the Forsyth Quadrangle in the right river bank opposite the mouth of Beaver Creek. The fining-upward sequence at this location is part of a terrace and clearly shows the sands and gravels at the base of the deposit and the finer-grained sediments near the surface. The top of this surface at one time represented the upper limits of the flood plain surface and the basal gravels corresponded to the bottom of the river channel.

Swamp deposits are vertical accretion deposits that receive sediment during times of high water flow, when the river's banks are crested and suspended sediment in the flood waters is deposited in areas well removed from the main channel. Swamp deposits are generally well drained and are covered extensively by mature trees as compared to the active point bar and marginal bar deposits. The principal geomorphic processes are vertical accretion of new sediment from annual flooding of the White River and its tributaries, pedogenesis, and bioturbation.

Swamp deposits were mapped primarily in the upper tributary valleys where streams are intermittent and valley width is relatively wide as compared to the scale of the stream channel. They are a minor environment in the project area.

A total of 4,390 acres (2.6%) acres were mapped as Floodplain in Bull Shoals Lake and 4,041 acres (5.4%) were mapped as Floodplain in Norfork Lake.

Eight (5.6%) sites are located on landforms mapped as Floodplain in Bull Shoals Lake. Six sites (4.5%) are located on landforms mapped as Floodplain in Norfork Lake.

Floodplains were mapped for eleven Survey Units. Of the area examined, 418 acres (5.6%) classified as Floodplain were examined. Two sites (2.2%) were recorded for areas mapped as Floodplain. One of these locations contained materials deeper than 20cm below the surface. No dart points or object pieces were recovered from Floodplains.

Table 24. Flakes Recovered from Floodplains (6 items in 2 collections)

Items per Collection	Number of Collections
1	
2-5	2
6-10	
>10	

Table 25. Bifaces Recovered from Floodplains (2 items in 1 collection)

Items per Collection	Number of Collections
1	
2-5	1
6-10	
>10	

Summary

Table 26 presents a summary of a portion of the tabular data presented above regarding the distribution of landforms and sites.

Table 26. Sites and Landforms*

	Bull Shoals Lake acres/sites	Norfork Lake acres/sites	Survey Units acres/sites
Summits	15.1/3.5	14.5/10.6	6.1/10.2
Sideslopes	74.3/38.5	70.8/34.1	60.9/32.9
Footslopes	3.3/22.4	5.7/12.9	5.8 /12.5
Terraces	2.0/30.1	2.6/31.8	19.9/36.3
Floodplains	2.6/5.6	5.4/4.5	5.6/2.2

*Figures given here are percentages

The comparison provided by Table 26 indicates very clearly that there is a very strong correspondence between the relative percentages of our five basic landforms in these two areas. The landscape present in Norfork Lake is not radically different from that in Bull Shoals Lake. It is, therefore, not unreasonable to suggest that, if the archeological record is a characteristic of the landscape, the archeological record of these two project areas may have some important, structural similarities. There are two *a priori* reasons for believing this to be the case. The first is a theoretical reason drawn from anthropological considerations. If the archeological record reflects the adaptation of a group of people to a particular environment, then we should expect that similar archeological records would be documented for similar landscapes; particularly within the same region.

The second reason for suspecting that the archeological record would be similar has to do, not so much with human factors, but with the natural processes which are constantly at work forming the archeological record. While, to be sure, there are local conditions which may alter the working of these processes, we can be certain that, over time, the same sorts of geomorphic processes are at work on the various landforms throughout the region.

The Landscape

There are certain parameters set by the landforms themselves to the nature of the archeological record. Since the processes which are at work on the Summits and Sideslopes are basically degrading processes, it must be expected that the archeological record on these landforms will be restricted to the upper few centimeters of the surface. Two very important consequences of this observation immediately come to mind. Because they are surficially oriented they are immediately subject to the geomorphic processes described above which work to remove such materials from their point of origin. In contrast to the natural processes at work removing materials from Summit locations and down the Sideslopes, there is quite likely to have been human processes at work continuing to add new materials to the archeological record found on Summits and Sideslopes. What one may expect to find in the archeological record on these landforms is a mixture of material resulting from the periodic and continuous removal and addition of items over a period of several thousand years.

The geomorphic processes at work on Footslopes are somewhat different. While degrading processes are certainly at work on these landforms they may well be exceeded by aggrading processes so that the net effect will be the accumulation of materials. We take this to mean that not only will such landforms receive archeological materials deposited "upslope" from them, Footslopes have at least the potential to retain more of the archeological materials originally deposited here. Further, archeological materials once deposited at the surface of these landforms may, in the course of Footslope evolution, become buried and thus more resistant to surficially oriented geomorphic and human processes.

Within the Fluvial Geomorphic system there is both a change in the nature and rate of the natural processes at work forming the archeological record from that present within the Hillslope Geomorphic System. Because of the relatively much greater dynamism in the fluvial system the potential for destroying and preserving discrete increments in the archeological record is much greater. Within the Terrace landforms we can expect the archeological record created on Pleistocene (and perhaps early Holocene) Terraces to be affected by processes like those at work on Summits. Materials will remain to be highly surface oriented. However, because of the higher rates of soil formation and bioturbation they may be incorporated deeper into the soil matrix (more quickly) at Terrace locations. Because of the nature of the soil matrix the degrading and eroding forces of rill and gully formation may be more important formative processes on Terraces.

In the case of Holocene Terraces we find not only degrading processes at work but also powerful aggrading forces. Just as lateral steam migration (bank cutting) reworks the sediments within which archeological materials have been deposited, vertical accretion acts to bury in place other portions of the archeological record. This results, at least potentially, in the creation of a three-dimensional archeological record within such landforms; those locations we often call stratified sites. Several such locations are present within both Bull Shoals and Norfork lakes.

The active Floodplain is, of course, the most dynamic portion of the landscape. Within the active floodplain the archeological record is most subject to reworking by lateral accretion. However, it is also possible that archeological materials deposited by humans onto and within recently reworked sediments may be subsequently buried and thus protected, to some degree, from surface-oriented processes.

The Materials

If we compare the scatters of lithic debris we call sites recorded for Bull Shoals Lake with that recorded for Norfork Lake we note that the major differences in "site distribution" between these two project areas occur on the Summits and Footslopes. It is difficult not to consider these differences as caused by different survey methods and techniques. This possibility is strengthened when we compare the percentage of sites found on the different landforms in all of Norfork Lake with those documented on the Survey Units. These percentages are almost identical, even though the relative percentage of landforms examined in the Survey Units is considerably different from the project area as a whole. However, since the sites recorded during the intensive survey make-up well over half of the total site inventory at Norfork Lake we should probably not place too much weight on this observation.

It is in the distribution patterns of the four categories of materials we examined that we believe the most insight can be gained in the distribution of the pre-Euro-American record.

The first thing we noticed was that examples of all of these categories (flakes, bifaces, dart points, and object pieces) occur on almost every landform. The only exception was the absence of dart points and object pieces from Floodplain locations. Flakes and bifaces are everywhere. Variability is expressed only in the way in which these items are concentrated into the various clusters (sites) we defined and the concentration of these clusters on Terraces and Footslopes. Put another way, we find that flakes and bifaces occur on Summits, Sideslopes, Footslopes, Terraces, and Floodplains. There are, however, fewer flakes and bifaces per unit of space on Summits and Sideslopes than on Footslopes and Terraces. Further, flakes and bifaces seem to occur in smaller concentrations on Summits and Sideslopes; there are fewer items per clusters. What we find on Summits is a very thin scattering of widely dispersed flakes and bifaces. What we find on or near the surface of Terraces are closely packed concentrations of flakes and bifaces.

To the extent that flakes, bifaces, dart points, and object pieces were the direct product of lithic tool manufacture, maintenance, and discard we can say that these activities were carried out across all portions of the landscape. The extent to which the observed differences in distributions of these materials is a product of natural geomorphic processes and/or human social forces is a matter we do not consider in this study.

CHAPTER 5. THE EURO-AMERICAN ARCHEOLOGICAL RECORD

In this chapter we consider the settlement and archeological record created by the Euro-American occupants of the area. As indicated in Chapter 1, this reconstruction is based primarily on the review of documentary evidence for this settlement. At the conclusion of this chapter we present a discussion of the various elements of this portion of the archeological record documented within the project areas to date by direct observation.

Sources and Studies

Local and County Records

At the present time, parts of Norfork Lake are to be found in the counties of Baxter and Fulton in Arkansas and Ozark in Missouri. The bulk of the public records of the former inhabitants of the Norfork Lake Project area are to be found in the courthouses for the counties. Unfortunately, the records for the first few decades of these counties were destroyed by fire. The records for Baxter County begin in 1890, those for Fulton County which was erected in 1842 begin in 1877, and the records for Ozark County (erected in 1841) are only complete after 1934. It is possible that some other primary sources may be found in Izard and Searcy counties, Arkansas, the parent counties of Baxter and Fulton counties, but, again, these county records are incomplete.

Bull Shoals is a larger project and spreads into more counties than Norfork Lake: Baxter, Boone, and Marion counties, Arkansas; and Ozark and Taney counties, Missouri. The status of the records in Baxter and Ozark counties has already been noted. Marion County was erected as Searcy County in 1835 from Izard County, but its name was changed to Marion County in 1836. Its records were destroyed in 1888. Boone County was erected from Carroll and Marion counties in 1869 and its county records remain intact. The Carroll County records, however, were destroyed in 1869 so it is unlikely that early material relating to Boone County exists. The records of Taney County, erected in 1837 from Greene County, were destroyed in 1863 and 1885.

The loss of so much of the primary documentation for the early Euro-American settlement of these areas makes it extremely difficult to offer any but the most general observations about the nature of the settlement during the period prior to 1880. In one area, however, this loss is partially offset by the presence of land title abstracts for both the Norfork and Bull Shoals project areas created by the sale of these lands to the government. These records are presently on file with the USAED,LR.

Federal Census Data

The decennial federal censuses records provide population data for census years for the regions of both Bull Shoals and Norfork lakes. Although these figures are county-wide and are not restricted to the project area, they do suggest general trends in population growth and retraction for the region (Goodspeed 1894: 22 and 35; anonymous 1941: 277, 436; Herndon 1947).

Other Data Sources through 1940

Other than the General Land Office (GLO) maps from the 1820s through the 1840s, only a limited amount of precise cartographic data is available for this region. For our purposes the most important sources are Norfork Reservoir: North Fork of White River in Arkansas and Missouri which the USAED,LR prepared in 1939 and Bull Shoals Reservoir: White River, Arkansas and Missouri which the USAED,LR prepared in 1941. These maps identify all houses and other large structures on what became Norfork Lake and Bull Shoals Lake immediately prior to the acquisition of these lands by the federal government. Aerial photographs taken during the 1930s are also available of these areas.

Two other maps are also of use. W.W. Hixson and Company prepared a *Plat Book of Ozark County, Missouri* early in the 20th Century. This undated volume shows land ownership and schools for this period although it does not show other structures. No comparable maps are available for Fulton or Baxter counties. Finally, the Project Tract Maps for Norfork Lake and Bull Shoals Lake identify property ownership at the time of federal acquisition in the early 1940s.

Two accounts of travelers in the region are of importance. The earliest of these is the journal account of Henry Rowe Schoolcraft (Park 1955). In the winter of 1818 and 1819 he and Levi Pettibone reached the northernmost portions of the White River system during their tour of the region. Schoolcraft's journal provides a day-by-day account of this trip; describing the native flora, fauna, events, and people they met. There is also the somewhat romanticized account of his adventures in the Ozark and Ouachita Mountains and other portions of "Far West" made by Friedrich Gerstaecker (Gerstaecker 1968). This account includes descriptions of numerous people, places, and events he encountered during his stay in the region from 1837-1843.

Historical research concerning Baxter, Boone, Fulton, and Marion counties, Arkansas, and Ozark and Taney counties, Missouri, has not produced much data which is useful specifically for historical archeological research centered on the Norfork Lake and Bull Shoals Lake project areas. Goodspeed (1894), *A Reminiscent History of the Ozark Region* contains useful biographical data for many of these counties. Sauer (1920) is an early overview of the physical and cultural geography of the general Ozark region. Rafferty (1980) is a more recent such study. Flanders (1979) also provides a recent overview of the Euro-American settlement for the Mark Twain National Forest which appears in Douthit et al (1979) which contains an extensive bibliography of both primary and secondary sources. Sabo, Waddell, and House (1982) is an overview for the cultural resources in the Ozark-St. Francis National Forest which includes a discussion of the Euro-American settlement of the Ozarks region. Dwight Pitcaithley's Ph. D dissertation (Department of History, Texas Tech University) concerning the settlement of the Buffalo River valley (primarily Newton County) also provides important information about the Euro-American settlement of that portion of the region (Pitcaithley 1976).

Additional studies include Gaskins (1893), Farris (1924), Estes (1928), Call (1930), Shiras (1939), Rea (1954, 1955), Yates (1973), Rafferty (1970, 1973a, 1973b, 1975), Messick (1973), Ingenthron (1980, 1983, 1988), Ayres (1982), Lair and Braswell (1983), and Bennett and Blakely (1987). These latter documents, however, are only useful at a particularistic level and not at the current general level of study.

The following pages present a summary derived from these various sources and other sources for the occupation and settlement of the upper White River valley from the 18th Century onward with particular emphasis on the Norfork and Bull Shoals areas.

18th Century Occupation: The French, Spanish, and Indians

In 1682 when Arkansas Post was established by Henri de Tonti as a post for trading with the Indians, the Osage controlled the area from the Missouri River to the Arkansas River, including the upper White River valley. Although originally spread throughout the area, by 1800 the Osage village sites were concentrated along the Osage River in Missouri, and along the Neosho and Verdigris River in present-day Oklahoma and Kansas. In the earlier period, some Osage lived in the White River valley, but by the late 1700s they came into the valley only on occasional hunting trips. The fierce reputation of the Osage discouraged other tribes from claiming the area.

Brief descriptions of the Indian camps he encountered are given in Schoolcraft's journal.

> A little below the junction of these streams we passed several Indian camps, but all in a state of decay, and bearing the appearance of having been deserted three or four years. These are the first traces of savage life (save some hacks apparently made with hatchets in saplings, notched yesterday and to-day) which we have seen since leaving the Fourche a Courtois. (Park 1955: 61)

> In pursuing up the valley of Swan Creek, about nine miles, we fell into the Osage trace, a horse-path beaten by the Osages in their hunting excursions along this river, and passed successively three of

> their camps, now deserted, all very large, arranged with much order and neatness, and capable of quartering probably 100 men each. Both the method of building camps, and the order of encampment observed by this singular nation of savages are different from any thing of the kind I have noticed among the various tribes of aboriginal Americans, through whose territories I have had occasion to travel. The form of the tent or camp may be compared to an inverted bird's nest, or hemisphere, with a small aperture left in the top, for the escape of smoke; and a similar, but larger one, at one side, for passing in and out. It is formed by cutting a number of slender flexible green-poles of equal length, sharpened at each end, stuck in the ground like a bow, and, crossing at right angles at the top, the points of entrance into the ground forming a circle. Small twigs are then woven in, mixed with the leaves of cane, moss, and grass, until it is perfectly tight and warm. These tents are arranged in large circles, one within another, according to the number of men intended to be accommodated. In the centre is a scaffolding for meat, from which all are supplied every morning, under the inspection of a chief, whose tent is conspicuously situated at the head of the encampment, and differs from all the rest, resembling a half cylinder inverted. Their women and children generally accompany them on these excursions, which often occupy three months. (Park 1955:107,108)

The French, and later the Spanish, at Arkansas Post licensed men to trade among the Indians up the White River, exchanging European goods for furs and skins. This trade was controlled directly from the Post, and no effort was made to establish a permanent trading post farther up the river. As the Osage came into the area less and less, trade with them on the White River became less important than the corresponding trade on other rivers.

Beginning in the 1790s with the arrival of the Cherokees on the St. Francis River, difficulties and disputes arose over which groups had the right to hunt and trade along the White River. These disputes sometimes took the form of raids on hunting parties and would not be completely resolved until the cession of Osage lands to the United States in 1808.

After the purchase of Louisiana by the United States, trade continued to be carried out by licensed traders. Much of the White River trade was still conducted from Arkansas Post, but in 1810 Jacob Wolf established a store at the mouth of the North Fork to trade with Indians as well as settlers.

Early 19th Century Settlement

The upper White River valley received little attention from European settlers until after 1800. Its location halfway between the settlements in Missouri and those in Louisiana, with only the small village at Arkansas Post, attracted only traders and trappers. Shaw (1903) contains a very brief account of the adventures and fortunes of one such group of trappers.

Both the French and Spanish administrations of Louisiana encouraged people to establish compact communities, which were easier to govern and defend than a dispersed population would be. These settlements grew along the Mississippi River, working their way south from Illinois and Missouri, and north from Louisiana. Given enough time, the two frontiers would probably have met somewhere near the Arkansas River.

This pattern of settlement changed following the French and Indian War. With the defeat of the French, the English gained title to the area between the Appalachian Mountains and the Mississippi River, which became an international boundary with Spain. Large numbers of settlers began moving into the Ohio, Tennessee, and Cumberland River valleys.

The pressures of the advancing line of settlement had two effects in the area west of the Mississippi River. First, the Spanish encouraged Indians displaced by the English to settle in Louisiana. The English, in general, hated and feared the Indians, and as settlements were established efforts were made to remove the threat of Indian attack by eliminating the Indians. The Spanish, who were generally on good terms with the Indians, offered them a refuge if they would settle in areas that could serve as buffers to discourage English settlers from claiming lands in Louisiana. For the Arkansas area, the Cherokees were the largest group to accept the Spanish invitation, moving to the St. Francis River in the 1790s following troubles with the English on the Tennessee River.

The second effect was more subtle. Unlike the earlier French and Spanish, the English-speaking settlers were aggressive frontiersmen. Instead of establishing compact and organized settlements they pushed out in all directions taking land by right of possession without regard for the niceties of legal ownership. As the line of English settlements work their way down the Ohio River, the more adventuresome people crossed into Spanish territory and built homes. The first of these settled along the Mississippi River as part of a trade network for those floating their goods to New Orleans by flatboat, but it was not long before there were English settlers moving up the rivers into the interior of Arkansas.

The first wave of English-speaking settlers into the upper White River valley began during the 1790s. These farmsteads depended on rivers and streams for transportation and so were dispersed along the banks at locations that had a variety of resources to feed the stock, as well as good soil for the garden.

This was the nature of European settlement in the area at the time the United States purchased Louisiana from France in 1803. One of the provisions of the sale was that the United States would confirm individual titles to property that was occupied at the time of the purchase. Although the process took several years, at least eight people were living on the White River and received title to their property (Lowrie 1834; Shinn 1908).

Schoolcraft describes approvingly the setting of an abandoned cabin-site not far from the North Fork River. After

> travelling ten miles, on descending the slope of a long hill, we descried at its foot a large cabin covered with split board, and were elated with the idea of finding it inhabited by a white hunter. On coming up, however, we were disappointed. It had apparently been deserted about a year, or eighteen months. We could not, however, resist the comfortable shelter it afforded from the weather, and encamped in it at an early hour in the afternoon. The site had been chosen with the sagacity of a hunter. A stream ran in front; on the back was a thick and extensive forest; and a large cane-brake commenced near one side of it, and extended to the banks of the river, so that it afforded great facilities for procuring the three great requisites for encampment, wood, water, and horse-feed. (Park 1955: 62)

Politically, the White River valley was part of the Orleans Territory until the Missouri Territory was formed in 1812. It was part of New Madrid County until Lawrence County was created in 1815. In 1819 most of Lawrence County and the White River valley became part of the new Arkansas Territory, although the area at the great bend of the river remained in Missouri.

Most of these early pioneers had pigs and cattle that were allowed to roam the woods, foraging for food. The farmsteads they established were little more than a cabin and a garden patch, because the stock did not need barns or pens, and there was no need to grow feed grains. The daily diet could be supplied in large measure by hunting and fishing.

Cornbread was a staple of the frontier settler's diet and a considerable amount of daily effort was expended in preparing the flour (meal) from which it was baked. Many of the farmsteads were equipped with steel grinding mills but many employed a method of preparation which was already several centuries old when the first Europeans arrived in the region.

> We began early in the morning to beat our corn into meal, by means of a wooden mortar and pestle he kept in the top of a firm stump, and a large wooden pestle attached to a spring-pole, adapted to play into it. It was an unwieldy apparatus, and worked with a tremendous clattering, attended with incredible fatigue to the operator. (Park 1955: 73; cf. also Park 1955: 95).

> As he had no flour in store, it was necessary to grind some, but his mill was more like a mortar than anything else. Such mills are frequent in Arkansas. A sound tree is cut off about three feet from the ground, and hollowed by fire, knife, and chisel till it will hold about as much as a pail; it is made as

smooth as possible, and a logger-head, or pestle of hard wood, is suspended to a balanced pole, such as is frequently fitted to wells. It may be imagined that pounding corn in this way is hard work, and as only a small quantity at a time can be prepared, it has to be done before every meal; but this is the only resource of those who are too poor to buy a steel mill. (Gerstaecker 1968:250)

The remains of such implements were also observed by Gerstaecker along the Cherokee Trail of Tears (Gerstaecker 1968:277).

Gerstaecker offered his readers a generalized account of how the new settlers went about establishing their homesteads.

The western settlers, and particularly those in the south-western states, are not very fond of hard work; in those wild regions they prefer rearing cattle and shooting, to agriculture, and are loth to undertake the hard work of felling trees and clearing land. To make the labour as light as possible, yet still to increase their fields, they generally clear a small space every autumn, and ploughing it very slightly, sow it with turnips, which answer best for new ground. Next year it is fenced in and added to the field.

When about to make a clearing, the American looks out for the largest and straightest oaks, which he fells, and splits into poles, from ten to twelve feet long, for fencing. When he thinks he has enough for this purpose, the rest is cut up and piled; next, the trees which have a diameter of eighteen inches and under, are felled, at about half a yard from the ground, and cut into lengths, while the larger trees are girdled all round with the axe, and very soon die. The shrubs and bushes are then rooted up with a heavy hoe, and with the help of the neighbours who are invited for the purpose, the whole, except the poles for the fence, is rolled into a heap and set on fire. (Gerstaecker 1968: 164-165)

Schoolcraft recounts the activities in which he and Pettibone were involved in assisting to establish a small farm while they awaited the return of their guides. They were

employed in chopping wood, clearing land. Our day's work, during the hunters' absence, will be much the same, and made up chiefly of the following particulars: in the morning, rise at, or before day break, and build a large cabin-fire, of logs eight feet long; then pound the corn which is to serve the family during the day. This is one in a wooden mortar, with a pestle attached to a spring pool. The time from this to breakfast is employed in patching mockasons, &c. We then sally out into the forest with our axes, and chop and clear away cane and brush until dinner, which answers also for supper, and happens about five o-clock, so that we never sit down without an appetite. Our bill of fare presents no variety. We have hominy, that is, corn boiled until it is soft, and bear's bacon for dinner, without any vegetables. The same for breakfast, with the addition of sassafras-tea. The day's work closes with building a large night-fire, and packing up, from the adjoining forest, wood enough to replenish it during the night, and succeeding day. We then lie down on a bear-skin before the fire, and enjoy the sweet repose from daily labour. (Park 1955: 95,96)

Schoolcraft describes a settlement along the White River and offers a generalization about the nature of the settlers and their lifestyles (Park 1955: 86-88).

The settlement at Sugar-Loaf Prairie consists at present of four families, located within the distance of eight miles, but is so recent that a horse-path has not yet been worn from one cabin to another. It is the highest settlement on the river, excepting two families at the mouth of Beaver Creek, about three miles above. These people subsist partly by agriculture, and partly by hunting. They raise corn for bread, and for feeding their horses previous to the commencement of long journeys in the woods, but none for exportation. No cabbages, beets, onions, potatoes, turnips, or other garden vegetables are raised. Gardens are unknown. Corn, and wild meats, chiefly bear's meat, are the staple articles of food. In manners, morals, customs, dress, contempt of labor and hospitality, the state of society is not essentially different from that which exists among the savages. Schools, religion, and learning, are alike unknown. Hunting is the principal, the most honourable, and the most profitable employment....

> Their system of life is, in fact, one continued scene of camp-service. Their habitations are not always permanent, having little which is valuable, or loved, to rivet their affections to any one spot; and nothing which is venerated, but what they can carry with them; they frequently change residence, traveling where game is more abundant. Vast quantities of beaver, otter, raccoon, deer and bear-skins are annually caught. These skins are carefully collected and preserved during the summer and fall, and taken down the river in canoes, to the mouth of the Great North Fork of White River, or to the mouth of Black River, where traders regularly come up with large boats to receive them. They also take down some wild honey, bear's bacon, and buffaloe-beef, and receive in return, salt, iron-pots, axes, blankets, knives, rifles, and other articles of first importance in their mode of life....
>
> Dried skins, stretched out with small rods, and hung up to dry on trees and poles around the house, served to give the scene the most novel appearance. This custom had been observed at every hunter's cabin we have encountered, and, as we find, great pride is taken in the display, the number and size of the bear--skins serving as a credential of the hunter's skill and prowess in the chace (sic).

The following paragraphs are taken from Schoolcraft's journal in order to provide readers with some glimpses into the physical aspects of the "slender chain of pioneer cabins (which) extended for 300 miles along the White River, from Batesville, Arkansas, to Forsyth, Missouri." (Sauer 1920: 150). Schoolcraft described the first occupied farmstead he and his traveling companion visited, a location near the North Fork River, in the following manner.

> Our approach was announced by the loud and long continued barking of dogs, who required repeated bidding before they could be pacified; and the first object worthy of remark which presented itself on emerging from the forest, was the innumerable quantity of deer, bear, and other skins, which had been from time to time stretched out, and hung up to dry on poles and trees around the house. The trophies of skill and prowess in the chace (sic) were regarded with great complacency by our conductor as we passed among them, and he told us, that the house we were about to visit belong to a person by the name of Wells, who was a forehanded man for these parts, and a great hunter. He had several acres of ground in a state of cultivation, and a substantial new-built log-house, consisting of one room, which had been lately exchanged for one less calculated to accommodate a growing family. Its interior would disappoint any person who has never had an opportunity of witnessing the abode of man beyond the pale of the civilized world. Nothing could be more remote from the ideas we have attached to domestic comfort, neatness, or conveniency, with allusion to cleanliness, order, and the concomitant train of household attributes, which make up the sum of human felicity in refined society.
>
> The dress of the children attracted our attention. The boys were clothed in particular kind of garment made of deer-skin, which served the double purpose of shirt and jacket. The girls had buck-skin frocks, which it was evident, by the careless manner in which they were clothed, were intended to combine the utility both of linen and calico, and all were abundantly greasy and dirty. Around the walls of the room hung the horns of deer and buffalo, rifles, shot-pouches, leather-coats, dried meat, and other articles, composing the ward-robe, smoke-house, and magazine of our host and family, while the floor displayed great evidence of his own skill in the fabrication of household furniture. A dressed deer-skin, sewed up much in the shape the animal originally possessed, and filled with bear's oil, and another filled with wild honey, hanging on opposite sides of the fire-place, were too conspicuous to escape observation, for which, indeed, they appeared to be principally kept... (Park 1955: 68,69)

Near the confluence of the North Fork and the White rivers they visited another farmstead where they

> were received with hospitality by the occupant, a white hunter, by the name of M'Gary. He had a field of several acres under cultivation, where he raised corn, with several horses, cows and hogs. The house was built of logs after the manner of the new settlers in the interior of Ohio, Indiana, and Illinois. He was provided with a hand-mill for grinding corn, a smokehouse filled with bear and other meats, and the interior of the house, though very far from being either neat or comfortable, bore some evidence that the occupant had once resided in civilized society. I noticed a couple of odd volumes of

books upon a shelf. Some part of the wearing apparel of himself and family was of foreign manufacture. Upon the whole, he appeared to live in great ease and independence, surrounded by a numerous family of sons and daughters, all grown up. (Park 1955: 80,81)

Frederick Gerstaecker also provides a description of various farmsteads at which he stayed. The next paragraph describes the farm of a Polish settler named Turoski near the Little Red River (Gerstaecker 1968: 89,90).

The Pole's dwelling was nothing but a simple rough log-house, without any window, and all the chinks between the logs were left often, probably to admit fresh air. Two beds, a table, a couple of chairs, one of them with arms, some iron saucepans, three plates, two tine pots, one saucer, several knives, and a coffee-mill formed the whole of his furniture and kitchen utensils. A smaller building near the house contained the store of meat for the winter. There was a field of four or five acres close to the house, and another about a quarter of a mile off on the river. He had some good horses, a great many pigs, quantities of fowls, and several milch cows....

The Indian corn of last harvest was in a small building in a field by the river. When, in the course of half an hour, I returned with the maize, Turoski had killed one of the fowls that were roosting on a low tree, plunged it in hot water, and while he cleaned it I fried the corn; then, while the fowl was being grilled, I ground the corn in the coffee-mill, which by no means reduced it to the consistence of flour. I moistened the grist with water, added a little salt, made a cake of it about three-quarters of an inch thick, and set it in a saucepan cover to bake. So far so good; but I wanted a couple of eggs. There was a kind of shed attached to the house, in which leaves of Indian corn, plucked green, and then dried, were kept as fodder, and here the hens came to lay their eggs.

Gerstaecker described his friend Slowtrap's house located in the northern Ouachita Mountains in the following way (Gerstaecker 1968:239-241). After several days of travel he and Slowtrap

arrived at Slowtrap's dwelling, planted on a spur of the hills which ran out into the plains. It was in no way different from the usual log-houses: sixteen feet square, from nine to ten high, with an enormous fireplace, no window, and a weighted roof; close by was a field of about seven acres, planted with maize. In the corners stood two large beds, covered with good stout quilts of many colours; between the beds, about four feet from the ground, was a shelf holding a few ore quilts, and the linen of the family, which was not over-abundant, comprising three or four articles for each person. Under this shelf were two "gums," trunks of a hollow tree, about a foot in diameter, and two and a half or three feet high, with a piece of board nailed on the bottom. They are applied to all sorts of purposes: I have seen them used as beehives; these, I subsequently found, were one for flour and the other for salt. Two wooden hooks over the door supported my host's long rifle, with its power-horn and shot-pouch. A shelf held some shoemaker's tools, leather, &c, Gun's Domestic Medicine, a family Bible, the Life of Washington, the Life of Marion, Franklin's Maxims, an almanac, and a well-worn map of the United States. Various files, awls, broken knives, and a bullet-mould, were stuck into the crevices of the logs near the fireplace. On the left of it were two short shelves, with four plates, two cups, three saucers, some tin pots, and a large coffee-pot, all as bright and clean as possible. In the corner of the fireplace was an iron pan with a cover, for baking bread, and two saucepans, one broken. Several joints of smoked meat hung from the roof, surrounded by strips of dried pumpkin suspended on poles.

Gerstaecker has included in his writings an account of a house raising he attended for a family named Collmar in this same general region (Gerstaecker 1968:263-268).

I soon crossed the highest summit of the range, and running down by the side of a small stream southwards from the hills, in about an hour and a half arrived at the place where Collmar's house was to be built, and where some of those who had arrived before me were occupied in cutting the logs.

The ground was already prepared and planks cut; other neighbours arrived from time to time with their dogs and guns, and the clearing was filled with laughing, talkative groups.

The horses were hobbled near some reeds, with plenty of maize shaken down in a dry place. In the evening, we all assembled at Collmar's hut, or rather shed, formed of boards fastened together, supported by poles, and containing three roughly-hewn bedsteads, a weaver's loom and two spinning-wheels. It may have been about fifty feet long and twenty wide, with the floor as nature supplied it. Rifles and saddles lay about; three pairs of deer hams adorned one corner, and dried pumpkins hanging to poles, formed the sky to this paradise.

Immense blazing logs were heaped up in one blackened corner, and from time to time it was necessary to throw a pail of water over the fire to prevent the planks from burning; and then clouds of ashes threatened us with the fate of Herculaneum and Pompeii.

All sorts of cooking utensils were crowded round the fire-a turkey was stuck upon a stick to roast, by the side of an opossum, dangling on a string from the roof...Collmar's wife, a stout, strong-built woman of about thirty-four, with two daughters of fourteen and ten, were all that belonged to the fair sex. They were busily employed about the fire with long-handled spoons, turning the meat in the frying-pans, and basting the turkey and opossum;....Boxes, chairs, and logs were placed round the table for seats...

We were up at daybreak, and prepared to build the house by first making a large fire to warm our hands and feet. A man with an axe stood in each corner of the rising house, to cut the mortices, and fit them into each other, while the rest of the party raised the logs; no trifling labour, as the house was to have two stories. By the evening, it was all up except the roof, when rain began to fall, and the logs became too slippery to admit of our standing on them; so the completion was left till dry weather.

We remained the night at Collmar's, and departed the next day on our various ways, after that very frugal breakfast, for we had devoured all his store.

Apparently high residential mobility was also a part of the frontier lifestyle as both Schoolcraft and Gerstaecker often note.

Mrs. H. tells me, she has not lived in a cabin which had a floor to it for several years; that during that time they have changed their abode several times, and that she has lost four children, who all died before they reached their second year. (Park 1955: 104)

Pitcaithley (1976: 86) reports that only 14 of the 54 settlers noted on the GLO surveys within the Buffalo River valley during the 1830s and 1840s bothered to get titles for the lands on which they were settled.

In the period between 1803 and 1860 more and more people moved into the White River valley, and the nature of the settlement changed under the influx of a new group of settlers who were more concerned with farming than herding or hunting.

The new settlers cleared fields and built barns and fences, although the farmsteads were still widely scattered, primarily along the alluvial landscapes along the White River and its major tributaries. Stream confluences were particularly favored. Poke Bayou, the settlement that became Batesville, Arkansas, was established in 1810 at the mouth of the creek of the same name. As settlements grew, roads developed to connect them, and farmers living where a road crossed a waterway often established ferries or stores to facilitate trade and travel.

While this seems clearly to have been the case for many parts of the Ozarks some researchers have argued the portion of the White River valley we are concerned with resisted agricultural settlement.

Gradually there was a slow immigration into the central regions, the process of settlement being slowest in the Courtois and the Osage-Gasconade River hills and longest delayed on the remote Arkansas border. The region has experienced no marked periods of rapid growth, except after the Civil War, and nothing that may be called a boom. Settlement has been by gradual and unobtrusive infiltration. (Sauer 1920:148)

Two problems continued to affect the settlers. The first was the question of Indians. The United States continued the English policy of trying to separate Indians and settlers. The Osage lands that included the White River valley were ceded to the United States in 1808, but a portion of those lands in Missouri were set aside as reservations for the Shawnee and Delaware. These reservations included the great bend area of the river where several Indian villages were located. Then, in 1817, a Cherokee reservation was established between the White River and the Arkansas River. The northern boundary of this reservation ran along the right bank of the White River from the state line to just above Batesville. Most of the Cherokee settled along the Arkansas River, but all European settlers were forced to move out of the reserved area.

The other continuing problem for the new settlers was the question of land titles. Titles could not be perfected until the land could be surveyed into the rectangular range and township system established in the Old Northwest Territory, but with such a vast amount of land to cover the surveyors were a long time in reaching Arkansas and Missouri. By 1825 the population had grown enough that Independence and Izard counties had been formed from Lawrence, and much of the land in these counties had been surveyed.

Now another complication to the land title question arose. Because the United States seldom had enough money to pay soldiers in cash, those serving in the military were sometimes paid with land warrants. At the end of the War of 1812, soldiers were given grants of 160 acres each to be located in land set aside from that purpose when surveys were done west of the Mississippi River. The location of an individual soldier's grant would be determined by drawing after the surveys were complete. Much of the land set aside for these military warrants was in northeast Arkansas. The majority of these claims were filed in the 1820s; many were within the modern boundaries of Fulton, Izard, and Independence counties (Christensen n.d.). Because the location of a claim was determined by lottery, the claims do not represent actual settlement, but rather reflect a cloud hanging over the titles of actual settlers.

Despite these problems the area continued to grow and after the Indian reservations were ceded back to the United States in 1828, Euro-American settlement began in earnest.

There are two direct sources of information about the location of individual farmsteads within our project area; the General Land Office Survey and the tract books of original entry.

In the region of Bull Shoals Lake, the GLO maps show the location of numerous fields and improvements, some of which are assigned names. These include Hadens (Township 21N Range 18W in Missouri), a mill (Township 23 North Range 19 West), the Town of Forsyth (Township 24 North Range 20 West), Mayers Mill and Solomon Stokey (Township 23 North Range 20 West), a grist mill (Section 21 North Range 15 West in Missouri), Keese's, Fance's, Mrs. Graham's, William Pumphrey's, James Forest's, and a Mill and Distillery (Section 22 North Range 15 West), James Cain, Charles Cain, and Holt's Mill and Distillery (Township 23 North Range 15 West), Archibald Friend (Township 21 North Range 17 West in Missouri), Morris (Township 22 North 17 West in Missouri), a mill and Yochem's Field (Township 21 North Range 15 West in Arkansas), Womach's Field (Township 19 North Range 16 West), and William's Field (Township 20 North Range 19 West). In all likelihood this indicates the occupation of the early to mid-1840s.

The original entry tract books provide complimentary data. The earliest land officially entered in the tract books of Arkansas were by Ewing Hogan in sections 1 and 2 of Township 20 North Range 16 West and by Leonard Coker in Section 5 of Township 21 North Range 19 West, all in 1838. 1840, 1841, and 1842 saw Richard Langdon, William Coker, Edward Coker, S. Rhode, Moses P. Ray, Joseph Coker, F. Fancher and another Joseph Coker enter land. One notes that none of these individuals are the same people seen by Schoolcraft in 1819. More people came in the late 1840s and the early 1850s, and it was only in the late 1840s that the Yochum's first entered their lands even though Yochum was noted as farming land on the GLO maps. Unfortunately the equivalent records for Missouri are currently unavailable, but it is clear that Forsyth was growing during this period of the 1830s and 1840s (Bennett and Blakely 1987: 17-21).

For the Norfork Lake area, similar settlement patterns can be seen. For example, Joseph Blackburn--who had three fields, Joseph Tevenbaugh, Bridge's, Matthew Stuiver, John Jones, and Daniel Parker are all identified on the Township 22 North Range 12 West GLO map of 1848 and in the official survey notes (e.g., Tevenbaugh's cultivated bottom land in Sections 2 and 3 of Township 21 North 12 West in Missouri; Survey Notes Vol. 621 p. 113).

Another valuable source for a description of the settlement of the region is Goodspeed's 1894 history of the Ozarks. This volume contains descriptions and anecdotes about many of the area's early families. These include the Coker family (Goodspeed 1894: 178, 403, 404, 670), reputedly the earliest in settler (ca. 1814) in the region; the Holt family (Goodspeed 1894: 178,403, 425); the Pumphrey family (Goodspeed 1894: 403); the Yochum family (Goodspeed 1894: 124, 125); the Fancher family (Goodspeed 1894: 687); the Fulbright family (Goodspeed 1894: 157-162). The 1850 census lists many of these early settlers, including William Coker "the patriarch of that Name" who was 81 in 1850 (US Census, Marion County, Arkansas, p. 319).

Goodspeed (1894: 86) also records some information about the earliest settlers in the Norfork Lake area.

> John Adams came to this neighborhood many years ago (ed., prior to 1824) and located among the Indians, three miles above the mouth of the North Fork, in what was then Izard (ed., now Baxter) County. At that time the Talburt and Wolf families were the only ones living here, and for many years, until the tide of emigration set in, Mr. Adams and his family had to put up with many inconveniences and hardships..."

Our review of the SLO Tract books for the lands which became Norfork and Bull Shoals Lakes suggest that the prime bottom lands were taken in a wave of immigration in the 1840s and 1850s. The hillslopes and hilltops remained unpatented until the first two decades of the 20th century. The patents of hillslope and hilltop lands show that frequent unsuccessful patents in the late 1890s and early 1900s were followed by the later successful patents.

Many of the immigrants came from the hill country of Kentucky and Tennessee where the land and the climate and, therefore,the agricultural practices were similar. The farms tended to be small, averaging about 25-35 improved acres in 1850. The principal crops were corn, rye, oats, and potatoes and hogs, which were still allowed free range, continued to be the principal stock item. Some cotton and tobacco were also produced. There were some slaveholdings in the White River counties, but they also were mixed crop farms, and nct of the same nature as the delta cotton plantations (DeBow 1854). Pitcaithley (1976: 90,91) reports a large community of free blacks, many of which were landowners, in the Buffalo River valley prior to 1860. These settlers were also largely from Tennessee. In 1860, however, all free blacks were forbidden by state law to live in Arkansas.

Agricultural industries grew along with the farm population. Mills were built on many creeks to grind meal, and as local needs increased, machinery was often added to saw timber or to gin cotton. Other small industries in the upper White River valley included a lead smelter at Dubuque and a nitre mine near Yellville.

One of the reasons for the growth of population along the upper White River beginning in the 1830s was the development of better transportation systems. The first major road throughout the area connected St. Louis with Fort Smith and crossed the White River at Talbot's Ferry. Although built for military purposes it provided a line of communication and trade between the White River settlers and those along the Strawberry, Eleven Point, Spring, and Black rivers. Other roads soon followed up the valley of the White River to connect Batesville with villages like Liberty, Mt Olive, Johnson, Dubuque, and Athens, and along Crooked Creek to Yellville and then on to Bentonville and Fayetteville. A settlement cycle took place where roads were built to reach newly settled areas; and new settlements grew up along the roads.

The roads made travel away from the river more direct, but even the best of the roads were rough, narrow, and hard traveling. Gerstaecker (1968:235) describes the manner in which wilderness roads were constructed.

> When a county road has to be cut, a director is appointed, who is authorized to assemble all the male population of the county from the age of eighteen to forty-five; and these stout sons of the forest soon make a clearance among the trees, and roll their trunks out of the way. But holes and other hindrances are left in a state of nature, if there is the slightest chance that a wagon can pass.

Most trade was still done on the river. The first settlers used flatboats and keelboats to take their products to market, whether in Batesville or all the way to New Orleans. By the early 1830s, however, steamboats were coming up the White River as far as Batesville. The town became a major regional trading center, and a transfer point for the farm products and supplies.

By the mid-1840s steamboats regularly traded up the White River as far as Buffalo Shoals (at the mouth of the Buffalo River), and occasionally reached Forsyth, Missouri. As the steamboats reached farther and farther up the river more river villages became local trade centers, opening up adjacent interior areas for development. Neighboring towns built roads to reach the river to take advantage of the increased trade, and the cycle of road building and settlement extension was repeated into new areas in the 1840s and 1850s.

By 1860 the upper White River valley was well-settled. Most of the choice farm lands along the river and up its major tributaries had been claimed, and in some areas settlement had begun on less desirable lands along minor creeks and up the sides of the hills. Total population in the White River counties had grown from 25,000 in 1840 to 75,000 in 1860.

Sauer (1920)'s depiction of the settlement of our project areas offers a somewhat different understanding of the nature of these particular settlers.

> This class of frontiersman, so numerously represented in the Ozark hills, formed little attachment to the place of their habitation. They were said to "continue there, until the game has disappeared, or the proper claimant of the land comes and 'warns them off.'" The nomadic habits of the frontier were developed to the highest degree in this footloose group...
>
> This class was typical, of course, of almost every frontier. It existed in greater purity, however, in the Ozark hills, and remained longer there than in most sections, because of the small and belated competition from agricultural immigrants. As Missouri developed, many men of this type moved west with the frontier. Others retreated into the hills south of the Missouri. Since the Ozark hills were almost unoccupied agriculturally for years after the surrounding regions had been converted to farming uses, this section long served as a refuge to the hunter frontiersman. Thus many became detached from that westward moving frontier of which they had been a part and remained in the hills. They gradually accepted agricultural habits, with varying degrees of success, or formed a local proletariat, working at teaming, tie hacking, clay digging, and other occasional jobs. (Sauer 1920: 151,152)

While in 1910 the percentage of land in Ozark and Taney counties was listed as 80-90% and the average size of farms in these counties was above 130 acres per farm they ranked in the lowest group of counties in Missouri in terms of the average number of acres of improved land per farm, 40-49 acres per farm with only 16% of Taney County and 19% of Ozark County in improved farm land (Sauer 1920: 178-182).

Civil War and Reconstruction

With the coming of the secession crisis following the election of 1860, the people in the upper White River valley found themselves in an extremely difficult political situation. The area was heavily Unionist in sentiment, and hoped to be able to persuade both Missouri and Arkansas to remain in the Union. Luck was not with them, however, for Arkansas joined the Confederate States while Missouri stayed in the federal Union, although with a rump Confederate government which operated from Texas.

This left the White River valley a much disputed borderland between the Union and Confederate armies. The people of the area were also divided in their loyalties, and in Arkansas the counties along the Missouri border became the locus of a Peace Society. The efforts of these people to remain faithful to the Union resulted in deep resentments that were reflected in the fighting that took place in the area.

Major battles took place at Pea Ridge and Prairie Grove in the northwest corner of Arkansas in 1862, and skirmishes and smaller engagements took place at Batesville, Talbot's Ferry, Calico Rock, Sylamore, Yellville, and Forsyth, as well as at numerous other places along the White River, its tributaries, and the roads that connected them. In addition, armies from both South and North passed through the White River valley on their way to Missouri or the Arkansas River valley.

Ingenthron (1980:123) provides a striking picture of the dislocation which occurred at the onset of the hostilities. He quotes General Order No. 13 from General Henry W. Halleck at St. Louis,

> The Rebels in the Southwestern counties of this state have robbed and plundered the peaceful non-combatants, taking from them their clothings and means of subsistence. Men, women and children have alike been stripped and plundered. Thousands of such persons are finding their way to this city barefooted, half clad, and in a destitute and starving condition.

A similarly bleak picture was painted by W. H. Tannard who witnessed what must have seemed to be a mass exodus passing through Fayetteville, Arkansas, in the winter of 1861-62.

> Missouri was in a deplorable condition, filled with scenes of violence and dark crime, and her people at this period were pouring through Arkansas in a continuous stream, moving with their household goods, negroes and stock to Texas, where they expected to find homes, security and peace. (Ingenthron 1980: 123)

The Union army made several raids into the area to destroy industries that were providing materials to the Confederates. Two such places were the lead smelter at Dubuque, and the saltpetre mines near Yellville. All of these military activities disrupted the lives of the residents of the area, farmer and townsman alike.

Not only were the residents subject to direct acts of violence, the pressures of supplying both armies placed great strains on the local economies. This was true of the Union army at Fayetteville and Batesville; the Confederate army at Batesville and Yellville. Armies, both men and horses, had to be fed, and it was difficult to maintain long supply lines. It was a time-consuming task to forage for food among the population, but this was often the best solution to the supply problems. For the local economy the result was often hardship and deprivation. The armies needed large quantities of corn and wheat, and were just as willing to take livestock and other crops without regard to the needs of the citizens. The Union army often used vouchers to pay supporters for what it took, but the process of collecting was long and uncertain.

Mills were a special target for both armies because it was easier to confiscate a large quantity of grain from a mill than it was to seek out the same quantity from a number of farms. The Confederate army frequently destroyed mills after taking the grain in order to deny their use to the Union army, and this action also hurt the residents.

With the capture of Little Rock by federal forces in September of 1863, the upper White River valley became less vulnerable to organized military actions. At the same time the border area became the focus of a violent, guerilla war. Often described by such perjoratives as "Bush-whackers" and "Jayhawkers" these bands roamed the countryside seeking food, shelter, and "traitors." Since some of these bands were Union sympathizers and some were Confederate sympathizers, no one was safe. Their standard of conduct seemed to be take what you want, destroy whatever is left, and ask questions about loyalties later. Colonel Weer's order to Lt. R. Carpenter depicts a desperate situation.

> It having come to the knowledge of the Colonel commanding, that the forage trains of this command are repeatedly fired into on the Osage Fork of Kings River by lawless men, who secrete themselves in the bushes and are encouraged and entertained by the inhabitants in that vicinity, you are, therefore, instructed to proceed to said neighborhood with the wagons placed in your charge, destroy every house and farm, etc, owned by secessionists, together with their property that cannot be made available to the army; kill every bushwacker you find. (Ingenthron 1980: 206)

Fierce Federal actions were reported by Captain Joseph G. Peevy, a Confederate intelligence officer, to Lt. Gen. Theophilus H. Holmes.

> They (ed. the Federals) have murdered every southern man that could be found, old age and extreme youth sharing at their hand the same merciless fates. Old Samuel Cox and his son, age 14; Saul Gatewood; Heal Parker and Captain Duval of Missouri were a part of those murdered in Carroll. They burned fifteen southern houses and all the out building. None of those thus made homeless were permitted to take with them any clothing or subsistence. They seem to have hoisted the black flag, for no southern man, however old or infirm or however little he may have assisted our cause, is permitted to escape them alive. (Ingenthron 1980: 206)

Many citizens abandoned their farms, homes, and businesses out of fear for their lives and became refugees. By mid-1864, the upper White River valley, especially the area between the great bend and Crooked Creek, became a desolate quarter, empty of settlers.

Some families from the upper White River valley sought the protection of the Union army in the neighborhood of Fayetteville and Bentonville. An effort was made to provide for some of the refugees by establishing farm colonies, each with its own militia for protection. Since plans called for two colonies in Benton County, four in Madison County, and eleven in Washington County, some of these may have been on that stretch of the White River of one of its tributaries (see Hughes 1987).

At the end of the war many returned to their homes and farms to find little left other than a chimney. They were faced with the task of rebuilding houses, barns, and outbuildings, and of reestablishing fields grown up in weeds and brush.

Again Ingenthron (1980:301) provides us with a succinct summary of conditions in the area.

> To gain a more precise view of the great burnt district, that extended through two tiers of counties; on either side of the border from the Mississippi River to Indian Territory, let us examine the fate of a few towns and villages adjacent to the state line.
>
> The county seats and commercial centers of northern Arkansas had been heavily victimized. Of 51 houses which comprise the town of Berryville in 1860, Hubbert's Hotel, formerly the Hailey House, and two small residence were all that remained at the end of the war. Reportedly, the hotel was spared the arsonist's torch because the Masonic records and regalia were stored in the upper story, where the brothers of the order had held their meetings in pre-war days.
>
> Carrollton, the county seat of Carroll County, was a flourishing and prosperous town before the war. It boasted four large stores doing a thriving business, a mill, a courthouse and large log jail, two substantial two-story hotels and a number of private residences. When the fighting ended, one springhouse and two dilapidated stables were left to mark the townsite.
>
> In the 1850's, Dubuque, Ark., located on White River at the mouth of West Sugar Loaf Creek, had been a busy steamboat landing with a thriving little community center. When the fighting began, a smelter there provided lead for Confederate bullets, and early in the war, Dubuque was a recruiting center for Confederate troops. The community and landing were totally destroyed by the Union forces and never rebuilt.
>
> In Missouri, all six central border counties had their county seats destroyed by fire.

Recovery to Full Settlement

In such a situation as that which prevailed at the end of the Civil War the area did not recover immediately but by the mid 1870s it was on its way to reestablishing itself and from that time until the 1920s the history of the upper White River valley was one of continued growth and development. Once inaccessible areas became available for settlement as transportation improved. Trading centers continued to flourish, but new industries also grew as the area turned to the exploitation of its natural resources.

The major instrument of change in the period was the building of the railroads into the area. Steamboats continued to operate on the White River, occasionally up as far as Forsyth. This was only roughly halfway up the length of the valley, and the boats were unreliable at best because they were limited to periods of high water.

Railroads, which could be built almost anywhere and were much less susceptible to the weather, offered the promise of easy and reliable transportation. Although Arkansas suffered from railroad fever as early as the 1850s, it was 1881 when the first railroad, the St. Louis & San Francisco Railway (Frisco), approached the White River valley at Fayetteville. The following year a charter was granted to the Missouri & Arkansas Railroad to build a line from Seligman, Missouri, on the Frisco, to the resort town of Eureka Springs, crossing the White River at Beaver. The rails reached Eureka Springs in February 1883, and were later extended into the Buffalo River valley at Gilbert. By 1887 another line had been built from Fayetteville to St. Paul on the White River in Madison County.

At the other end of the valley the St. Louis, Iron Mountain & Southern Railroad (later MoPac) built a line into Batesville in 1880. Early attempts to build a railroad from there to Carthage, Missouri were unsuccessful, but the route was finally opened in 1902. It followed the north bank of the White River from Batesville to Cotter, then crossed the river and ran west along Crooked Creek before turning to the north where it crossed the White River once more at Branson, Missouri.

The building of the railroads continued the cycle of settlement extension. Now towns grew along the railroads; roads were built to the towns; farms were established along the new roads; and new villages formed to serve the farmers. These local service centers often developed around a crossroads store which frequently included a post office, and might have a mill associated with it.

The creation of a system of universal public education with the schools located close enough together to be within reasonable walking distance for most children also created a public building that served its community in many ways. Some schools were held in churches; some churches were held in schools. In either event, the building became a focal point that might also be used from Grange or other lodge meetings and for social activities.

Many industries benefited from the building of the railroads. Farmers, who began growing cotton as a major cash crop shortly after the Civil War, now had better access to markets and could time the sale of their cotton to take advantage of the best prices. But the railroad also made it possible for farmers to expand into more perishable crops. In the western part of the valley, orchard crops, especially apples, became a major part of the economy. To the east, farmers began to supply cream to Springfield and other Missouri cities.

As in other parts of the state, the railroads made it possible to cut and ship timber and lumber as a commercial venture. Although limited by the steep terrain, the cutting of the forest opened new areas for farming, and previously unclaimed land was now put to use.

The mining districts along the Buffalo River and Crooked Creek, which had been active off and on since the 1850s, experienced a boom in the early 1900s. Lead and zinc prices reached a peak during the years of World War I, and the railroads made it possible to ship the ores cheaply and reliably.

Finally, the railroads helped bring about the start of a new industry -- the tourist industry. Although the healing qualities of the waters at Eureka Springs were known before the Civil War, it was not until the railroad reached there in 1883 that the town became a resort city. Helped along by the advertising efforts of Arkansas Governor Powell Clayton, in the first year that Eureka Springs was served by the railroad 23,500 passengers (and a large quantity of freight) traveled that route (Hull 1969).

By the end of the 1920s the upper White River valley was fully occupied. National and international events affected the area mainly through the rise and fall of crop and mineral prices. Each economic upset had left the area vulnerable so that it faced the middle of the 20th Century with few economic reserves.

Modern Landscape

Since the 1920s the major forces for change in the upper White River valley have come from the actions of government and governmental agencies. The first institution effected was the road system. From the time of the first settlers roads had been the responsibility of the people who lived along them -- to survey them, maintain them and improve them. With the growing use of automobiles and trucks for transportation and trade, however, there was a growing need for a coherent network of roads. A "Good Roads" movement gained strength in the early 1920s and led to the creation of state highway departments charged with developing a state-wide network of professionally engineered, paved or gravel, safe roads. By 1928 the route from Batesville to Bentonville was graded the whole way, and most of it was graveled.

The continuing road improvements and the growing ownership of cars led to changes in the patterns of the local service centers. As farmers were able to travel conveniently to larger towns and villages which offered a variety of services, many local stores, mills, and post offices went out of business.

Local schools also felt the effects of the improvements in the road system. These changes, and the development of the school bus, coincided with changes in educational theory that called for bigger, consolidated schools which could offer more subjects than the country schools. In many areas the number of schools was reduced by 50-75% between 1915 and 1930.

The devastating flood of 1927, the severe drop in farm crop prices, and the Wall Street Crash of 1929 brought the White River area into the Great Depression. Although the mixed crop farms of the area had a better chance of providing a family with a living, the times were still tough. Among the many federal agencies working to provide for people was the Civilian Conservation Corps (CCC). A unit of the Ozark National Forest, called the Sylamore Ranger District, had been established in Stone and Marion Counties in 1908. Two CCC camps, Camp Big Flat and Camp Hedges, were established in this district in the 1930s. Men from these camps worked on grading roads, and building bridges, scenic overlooks, and trails. For this work they were provided room and board, and were paid a small salary.

The Works Progress Administration (WPA) also provided aid to the White River valley. This took the form of grants to local and state government for building public buildings, such as schools and libraries, and for building bridges to continue to improve the highway system.

Despite the help of various government agencies, by the 1930s the upper White River valley was losing population. The agricultural base of the economy suffered tremendously during the depression. By 1930 large numbers of farms were being worked by tenants rather than owners. The percentage of farms operated by tenants ranged from 30% in Benton County to 90% in Stone County. The future seemed so bleak in some parts of the area that proposals were made to take entire counties into the National Forest system.

That did not happen, but another government agency began to develop resources in the area. In accordance with plans for the White River basin drawn up as part of the Flood Control Act of 1938, in 1941 the U. S. Army Corps of Engineers began work on the Norfork Dam on the North Fork. Completed in 1944 this was the first of the series of dams and lakes built in the area for both flood control and power generation. Bull Shoals Dam was begun in 1947, Table Rock Dam in 1954, and Beaver Dam in 1960. The land covered by each of these lakes resulted in an initial displacement and loss of population, but these losses were soon made up by the growth experienced by nearby towns. Norfork, Bull Shoals, and Table Rock lakes and their surrounding areas became oriented toward tourism and recreation and new businesses grew to serve these needs. Beaver Lake became more of a residential area, but its growth also encouraged the growth of support services.

The upper White River valley is known today, as it was at the time of the first settlements, for its natural beauty. Changes in trade and transportation have moved away from the river, but the river and its lakes are once again the central focus of the economic life of the area.

In concluding this portion of our consideration of the Euro-American occupation of the area we present the following which summarizes the population growth and decline for the counties within which Bull Shoals and Norfork lakes are located.

Table 27. Population Schedules
Norfork Lake

Year	Baxter	Fulton	Ozark
1850		1,819	2,294
1860		4,024	2,447
1870		4,843	3.363
1880	6,004	6,720	5,618
1890	8,527	10,984	9,795
1900			
1910	10,192	12,143	11,926
1920	10,210	11,182	
1930	9,520	10,826	9,537
1940	10,281	10,253	10,776

Bull Shoals Lake*

Year	Marion	Boone	Taney
1840	1,325		3,264
1850	2,308		4,373
1860	6,192		3,576
1870	3,979	7,032	4,407
1880	7,907	12,146	5,599
1890	10,390	15,816	7,973
1900	10,127		
1910	10,203	11,577	9,134
1920	10,154	16,098	8,178
1930	8,763	14,933	8,867
1940	9,464	15,860	10,323

*See Norfork Lake for Ozark County, Missouri.

The Documented Euro-American Archeological Record

Bull Shoals Lake

The Euro-American archeological documented to date in the project areas consists almost entirely of remnants of the built environment. Within the Bull Shoals Lake project area the Euro-American archeological record is documented at 22 locations. Some 16 of these consist of the notation that Euro-American artifacts, primarily ceramics, were noted at what were primarily pre-Euro-American sites. One location, 3MR41, an old ferry crossing, is known solely from archival documentation. The Euro-American built environment is recorded at only five locations.

Previously recorded sites in Bull Shoals Lake were compared with the General Land Office Maps (mid-19th Century) and Project Maps (1941). The results of this comparison are given in Table 28.

Table 28. Recorded Sites and Cartographic Sources*

Site	Legal Location	GLO	Project Map
3BO217	sec. 3 T21N R18W		
3BO219	sec. 9 and 16 T21N R18W		
3MR117	sec. 26 T20N R16W		
3MR119	sec. 11 T20N R16W		
3MR127	sec. 13 T20N R17W		
3MR128	sec. 13 T20N R17W		
3MR130	sec. 1 T20N R16W		
3MR131	sec. 30 T21N R15W	x	?
3MR133	sec. 23 T21N R17W		
3MR137	sec. 22 T21N R17W		
3MR139	sec. 34 T21N R18W		
23OZ73	sec. 26/27 T22N R15W	x	?
23OZ77	sec. 18 T22N R15W	x	?
23OZ79	sec. 25 T22N R16W		
23TA41	sec. 30 T24N R20W	x	
23TA43	sec. 33 T24N R20W		
23TA270	sec. 35 T23N R20W	x	?
23TA277	sec. 11 T22N R20W	?	

* x = present; ? = possibly present

Of these sites only the three at or near Forsyth deserve comment at this point. Site 23TA41 is old Forsyth. It has been tested and determined eligible for the National Register of Historic Places, but further testing was conducted and the following nomination form was rejected for inclusion on the National Register (Bennett and Blakely 1987). Site 23TA43 has what appears to be 8 burials on it and is in an area which contained armaments. This site could be the grave of Civil War soldiers. See the description of burials at Forsyth in Bennett and Blakely (1987). Finally, the bridge over Swan Creek is listed on the National Register although it is not an archaeological site.

Norfork Lake

There are 39 locations in Norfork Lake at which the Euro-American archeological record is recorded. Of these, only three are composed primarily of lithic debris with a few Euro-American artifacts. Twenty five of these are situated on sideslopes (64.1%) and six (15.4%) were found on summits. Remnants of the built environment are recorded at 31 locations; 22 of which are locations at which structures are shown on the 1939 Project Area Map.

Sites marked on the GLO maps for the Norfork Lake Project Area were compared with sites identified by survey. The following correlations could be made for the areas surveyed.

Three fields or improvements were noted which belonged to James Blackburn. He had a field on the section line between Sections 16 and 21 of Township 22 North Range 12 West. A large prehistoric site, 23OZ173, was found in exactly the same location. This may indicate that the prehistoric activity had removed the timber and that the land had been relatively easy to place into farm use. Blackburn also had a field between Sections 21 and 22 of the same township and range. Again a large prehistoric site, 23)Z175, was found in that location. No evidence was found in the area of Blackburn's third field on the section line between Sections 22 and 27 of the same township and range. Historic period site 23OZ177 was found between these last two fields and potentially could be related to Blackburn.

The property of Mathias Swiver was noted on the section line between Sections 28 and 33 of Township 22 North Range 12 West. The project boundary follows this line and no historic remains were found within the boundaries. An historic site, on private property north of the line, was seen but was not recorded.

Two improved areas were noted which belonged to Joseph Teberbaugh. The first was located on the Township line between Section 34 of Township 22 North Range 12 West and Section 3 Township 21 North Range 12 West. A large prehistoric and historic site, 23OX187, was found at this point. It also should be noted that the Price Cemetery is located just to the south of Site 23OZ187. Yates observed that the Price Cemetery, apparently named after the Price family who owned the land in the 20th century, was on land formerly owned by Jobe Teverball (Yates 1973: 56). This may be the earliest Euro-American cemetery in the region. It must be noted, however, that the site is also an Indian cemetery (Perry quoted in Kross 1987: 14). Teberbaugh's second improved piece of land was located on the section line between Sections 2 and 3 of Township 21 North Range 12 West. No cultural remains were found at the precise mapped location although another large prehistoric site, 23OZ131, was identified immediately adjacent.

No sites were located on the Arkansas GLO maps for the areas surveyed as part of this project. Although land patent dates do not rule out earlier Euro-American use, the following list provides the patent dates for the sixteenth sections on which historic sites were found. These dates provide an approximat

Table 29. Patent Dates and Euro-American Sites: Intensive Survey Norfork Lake

Site	Patent Date	Site	Patent Date
3BA160	1915	3BA175	1887
3BA162	unknown	3BA181	1912
3BA163	1858	3BA184	1922
3BA164	1858	3BA186	1851
3BA166	1860	3BA187	1858
3BA167	1888	3BA188	1898
3BA168	1888		
3BA169	1860		

Summary

It is clear that the process of documenting the Euro-American archeological record within the project areas has hardly begun. This record can be expected to be extensive and to be expressed in many different and very subtle ways. The preceding pages detailed a history of rural, largely agrarian, settlement which included the clearing of crop and pasture land, the building of farmhouses and auxiliary structures, and the construction of roads and other elements of the settlement infra-structure. The nature of the built environment, the methods and materials of construction, and the function it served certainly changed over the 100 year period of Euro-American occupation. The location of farmsteads along the Terraces and Footslopes seemed to be a pattern of the early 19th Century settlement; leaving Summits and Sideslopes for later. Mining and timber harvesting were also important economic activities for which elements of the built environment were constructed.

The number and nature of the artifacts deposited into the archeological record also changed through time. It remains to be seen if the scatters of these materials have a high degree of correlation with particular elements of the built environment.

CHAPTER 6. SUMMARY OBSERVATIONS

In this short concluding chapter we draw attention to what we believe are some important consequences this study has for the continuing inventory efforts at Bull Shoals and Norfork lakes.

It is our judgment that this study and the work which has proceeded it is sufficient to provide an accurate general understanding of the nature of the archeological record within these project areas. It should now be possible to anticipate, in general terms, the kind of archeological record to be encountered in further inventory efforts; particularly as concerns the pre-Euro-American archeological record distributed on the various landforms of the project area landscape.

Along the Summits and Sideslopes we should expect to find sparse surface scatters of lithic debris. These scatters will likely be composed of materials deposited over a long period of time so that they presently constitute of mixture of debris from over several thousands of years. A major exception to this pattern would be the presence of rock-shelters which, if present, can be expected to be found in areas mapped as Sideslopes with rock faces. On the Footslopes the prehistoric lithic debris should be found to be more concentrated and primarily surface oriented, but it is not possible to rule out the presence of colluvially buried portions of the archeological record within these landforms.

The archeological record on Terraces will vary according to the age of the individual landforms. On structures of Pleistocene age, we should find near-surface scatters, perhaps locally dense scatters, of lithic debris. Younger terrace structures also have a high potential to have locally dense scatters of lithic debris at or near-surface as well as discrete increments of this record buried at some depth. In attempting to document this buried material it should be remembered that there is no necessary correlation between deeply buried and surface materials. Finally, we note that while there is insufficient data in this study to discuss the distribution of the pre-Euro-American built environment, the earlier literature suggests that such may also be strongly clustered on Terraces.

On present evidence it appears as if the pre-Euro-American archeological record within the active Floodplains is very sparse and is quite likely to be of relatively recent origin.

Regarding the Euro-American archeological record we can offer the following observations. It is possible, on present data, to locate many of the aspects of the built environment within the project areas by the use of cartographic information. Further, the general nature of this built environment can be inferred from documentary accounts of various types. It should therefore be possible to specify in large measure the type of Euro-American archeological record to be found on any portion of the project area landscape through the use of these documentary materials.

Given these observations we have formulated the following recommendations to be considered in developing the continuing inventory programs at Bull Shoals and Norfork lakes.

(1) We recommend as of highest priority the addition of the information about aspects of the Euro-American built environment available from cartographic and other documentary sources be added to the GIS data base. By creating a layer of this information within the system it will be possible to identify immediately those locations documented in this way. Such information will be of vital importance as decisions are made about how and when further field documentation efforts are to be undertaken.

(2) We recommend that field investigations be undertaken to refine the landscape model created by WES. While this model is certainly adequate for present planning purposes further refinement at a finer scale, particularly for those portions of landscape within the fluvial geomorphic system (Terraces and Floodplains) is essential prior to any land-altering projects in these areas.

(3) Since the regulation which empowers these inventory efforts requires that the inventory consists of "historic properties" it is very important that work begin on the creation of the necessary Historic Contexts needed to provide overall guidance in the evaluation process. It is recommended that such work be undertaken prior to the initiation of further general survey efforts so that these efforts can be directed more efficiently toward those portions of the archeological record which are likely to be judged significant.

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